Putting the Public in Public Involvement: A Case Study in Texas Groundwater Management

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Abstract

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For any public policy issue with scarce financial resources and impending deadlines, decision makers must find or construct a public engagement process that is both useful in terms of satisfying participants and producing an outcome as well as practical in terms of the budget and time constraints. This report explores the history of groundwater management in Texas, identifies current problems with the public involvement processes under House Bill 1763, and proposes different options for seeking public input. Groundwater is a quasi-public good and, as population growth continues to put pressure on a scarce and finite resource, public input is increasingly considered valuable in crafting desired future conditions and management strategies necessary to achieve those conditions. This report evaluates four public input processes in the context of groundwater management in Texas. The evaluation criteria and the processes may be

useful for other public policy issues. In assessing these four processes, a correlation emerges between satisfying transparency, neutrality, representation and flexibility, and the increase in time and cost of the process. However, the benefits of a full public engagement process may far outweigh the front-loaded cost.

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Chapter 1: Introduction

"A fundamental challenge for administrative governance is reconciling the need for expertise in managing administrative programs with the transparency and participation demanded by a democratic system."[1]

Public engagement processes have long been part of making public policy, especially for environmental issues and natural resources. These processes began as methods for informing the public about policy issues to gain support and evolved into methods where the public directly participates in making decisions.[2] The first formalization of these processes came about in the 1940s with the Administrative Procedure Act. Government agencies were ordered to provide notice of decision making procedures to the public, provide information about the issue and take comments.[3] By the 1960s and 1970s public participation saw a surge, especially in environmental agencies such as the Environmental Protection Agency (EPA), the National Forest Service, and the Bureau of Reclamation.[4] The National Environmental Policy Act mirrored the Administrative Act of the 1940s, requiring public notice of governing body meetings and using public hearings to take comments.[5]

Critics note that public hearings are more of a formality in governing rather than a method for citizen participation.[6] According to Lando, this process of a governing body sitting at a dais taking timed comments from individuals "in favor of" and "opposed to" a

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[1] Thomas Beierle and Jerry Cayford, "Introduction," in *Democracy in Practice: Public Participation in Environmental Decisions,* (Washington, DC: Resources for the Future, 2002), 3.
[2] James L. Creighton, "Public Participation in Federal Agencies' Decision Making in the 1990s," *National Civic Review*, Vol. 88, No. 3 (Fall 1999): 249.
[3] Beierle and Cayford, "Introduction," 3.
[4] Creighton, "Public Participation," 250.
[5] Ibid., 250.
[6] Tom Lando, "The Public Hearing Process: A Tool for Citizen Participation or a Path Toward Citizen Alienation?" *National Civic Review,* Vol. 92, No. 1 (Spring 2003): 73.

policy or decision engenders adversarial positions rather than agreement.[7] Simply posting notices and taking comments through these legally required processes did not result in acceptance of the decisions.[8] A different approach was needed.

The different approach appeared with the growth of the alternative dispute resolution (ADR) movement. ADR researchers promulgated using neutral third-party mediators to facilitate decisions for many types of conflicting situations. The EPA instituted negotiated rulemaking – a process where conflicting parties participate in writing regulations with help from a third-party mediator.[9] Even with the emergence of contemporary methods such as mediation and consensus building, the standard public hearing has persisted in national, state and local statutes as a minimum requirement for public participation. McKinney and Harmon note, "Agencies say they are overworked and understaffed, and that dwindling budgets are further tapped by public participation requirements."[10] Public hearings are quick and inexpensive relative to other processes. Can a public involvement process be made more meaningful without tapping out financial and temporal resources? How does an agency go about evaluating and designing such a process?

Before embarking upon evaluating and choosing a public involvement process, it is of the utmost importance that the governing body knows the purpose of the process.[11] Will the final product be a statement of values, a number, or a list of actions? Will the product be used as an advisory opinion to the governing board, or stand as the decision itself? The governing body must be able to make the connection between the outcome of

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[7] Lando, "The Public Hearing Process," 73, 76.
[8] Creighton, "Public Participation," 250.
[9] Ibid., 257.
[10] Matthew McKinney and Will Harmon, "Public Participation in Environmental Decision Making: Is It Working?" *National Civic Review,* Vol. 91, No. 2 (Summer 2002): 149.
[11] Ibid., 155-156.

the public process and the decision that will be enforced. The public must also be aware of this connection from the beginning, otherwise, such a process is a waste of resources and the result may be challenged by those who feel wronged or alienated. Once a governing entity identifies the role of the outcome, then it can go about evaluating and choosing a public process.

Groundwater management in Texas is an excellent illustrative case study for demonstrating the complexity of many environmental policy issues and the need for improved public involvement processes. The ripeness and complexity of the issue also shows that a better process needs to be in place before dramatic change occurs. According to the United States Census Bureau, Texas is one of the fastest growing states by population percentage, increasing by 14.6 percent in the last seven years to total 23.9 million people in 2007.[12] Population growth combined with development, pollution and climate change threaten the quantity and quality of all water resources in the United States. Even if a municipality, county or another political entity does not feel pressure from its own population to exploit the local water resource, water stressed entities will eventually show interest and offer to buy the water to export it back to their area. Notable examples in Texas are the battles among environmentalists, municipal authorities and developers over Caddo Lake in East Texas and Canyon Lake in Central Texas. As water resources become scarcer, government intervention is needed to help ensure equity and accountability in resource planning and management.

The State Legislature recently required groundwater managers all over Texas to plan the future of the resource on an aquifer wide level rather than smaller localized levels. Managers had a little over two years to report these plans before December 2007. Yet, only one planning area was able to make a few decisions by the deadline. The

[12] U.S. Census Bureau, "National and State Population Estimates," http://www.census.gov/popest/states/NST-pop-chg.html (accessed January 19, 2007).

complexity of groundwater and the lack of guidance on public processes have hindered managers. Some groundwater managers and policy makers contend that with or without a meaningful public involvement process, it is likely there will be legal challenges to management decisions. However, a meaningful public involvement process is more likely to satisfy the greatest number of interests than no process at all and reduce the likelihood of these legal challenges. Processes also create the momentum needed to proceed and meet deadlines.

This report answers the questions: how do public managers evaluate public processes when working with a complex policy issue, limited resources, and a requirement to do only the bare minimum such as a public hearing? How do decision makers strike a balance between a process that is both satisfying for the participants and practical for the decision makers? The management of public and quasi-public goods, such as groundwater, requires much more flexible public engagement processes that actually allow meaningful public input as well as adapt to multiple jurisdictions, resources, stakeholder groups, and complex scientific data.

This report uses existing literature on public processes and the literature on statutory requirements of groundwater management in Texas to describe the historical and current status of the use of public processes in decision making for this resource. Further considering basic criteria, evaluating methods and adaptations of models used in environmental planning cases, this report examines four public input methods and recommends the range of processes best suited for public involvement in groundwater management and planning in this state. The results of field work from one public process and the results of a questionnaire sent to state groundwater managers are used as primary sources of data about the needs and challenges of public processes in Texas groundwater management.

The findings of this report show that a range of public processes can be both useful for the decision makers and satisfy participants' needs to be heard and to participate in a fair and open process. When the resources are available, a full blown public engagement process such as consensus building or a citizens jury should be used. Yet, when resources and time are limited, simply augmenting the traditional methods, such as using a neutral facilitator at open meetings, to meet more of the qualitative criteria can still result in a worthwhile process.

The rest of this report is organized as follows. Chapter 2 elaborates on the historical context of groundwater management in Texas and the need for evaluation of several public involvement methods. Chapter 3 presents the methodology and criteria as well as introduces the four types of public input processes examined. Chapter 4 applies the four processes to groundwater management in Texas and evaluates their practicality for implementation. Chapter 5 concludes with a summary of the findings that are applicable to any policy issue. It also recommends options for consideration by the public, groundwater managers and state policy makers in the specific case of groundwater management.

Chapter 2: Overview of Groundwater Management in Texas

Today, it is necessary to plan for the current and future use of any water resource. Any reason not to do so is not a reason but an excuse. In addition to daily life in the home, groundwater is needed for agriculture, businesses, recreation and wildlife habitat. Texas has been planning water use on a state and regional level for decades. The result is that even with population growth and drought, Texas has not yet faced a situation like that of Georgia and Lake Lanier where decades of poor water planning coupled with drought led to a state of emergency.[13] Water is nonetheless still an ever increasingly scarce common resource in this state, and the public should be involved in the planning process.

This chapter uses groundwater to illustrate the complexity of many environmental and natural resource planning policy issues and demonstrate the need for more public involvement in planning and decision making as well as the need for evaluating how the public should be involved. This chapter examines groundwater as a quasi-public good and the difficulties in managing such a good. It shows how the historical context of groundwater management in Texas reinforces the complexity of the issue as well as the problems with current statutory requirements for managing this common pool resource. The chapter concludes with the results from the questionnaire sent to state groundwater managers. These results further support the need for an evaluation of public involvement processes.

[13] Matt Kempner, "Recipe for a Water Crisis: Plan. Fail. Repeat," *The Atlanta Journal-Constitution*, December 16, 2007, sec. 1A.

GROUNDWATER AS A PUBLIC GOOD

In Texas, land owners are led to believe that they have unlimited right to water on their land through the Rule of Capture. Because of the Rule of Capture, many may see groundwater as a private good, one defined by property rights. The Rule states that a property owner has the right to all the water under his or her property.[14] This means that landowners may pump as much water as they want from their land, regardless of the consequences for neighboring property owners. Yet, groundwater is not a private good and should not be subject to landowner's private desires. The defining criteria of a private good are excludability, meaning it is possible to deny someone the good; and rival in consumption, meaning it is not possible for more than one person to consume the good at one time.[15] A public good is the opposite: it is non-excludable and non-rival in consumption.

The Rule of Capture and the nature of groundwater preclude groundwater from being a private good. In regard to the first criterion, excludability, a land owner cannot be denied the groundwater underneath his or her property according to the Rule. Unless an authority is willing and able to monitor all wells and withdrawals on all properties over the aquifer, or the legislature eliminates the Rule, the groundwater is non-excludable. The second criterion, rival in consumption is less clear. Because aquifers are large enough to span underneath multiple tracts of property, it is possible for two or more property owners above an aquifer to pump groundwater from the aquifer at the same time. Yet, one land owner pumping excessive amounts of water from his property could in theory

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[14] Harry Potter, "History and Evolution of the Rule of Capture," in *100 Years of Rule of Capture: From East to Groundwater Management*, ed. William Mullican and Suzanne Schwartz (Texas Water Development Board, June 2004), 1.

[15] Vincent and Elinor Ostrom, "Public Goods and Public Choices," in *Policentricity and Local Public Economies,* ed. Michael D. McGinnis (Ann Arbor: University of Michigan Press, 1999), *76*-77.

prevent another land owner over the same aquifer from pumping water because of drawdown. Thus, groundwater may be rival in consumption.

To further complicate the matter, some above-ground springs that depend on aquifer levels and flows are open to the public for recreational use. Finally, groundwater is so basic to human needs, to economies, and to wildlife that it is essential to the public welfare. Since groundwater is non-excludable, but sometimes rival in consumption, it cannot be a pure public good. Economists call goods such as groundwater a quasi-public good or a common pool resource. Regardless of the technical name, these goods must be managed differently than private goods because market forces are unable to control the resource in a way that maximizes social welfare.

Renowned environmental economist and native Texan Garrett Hardin presents the problem of an unmanaged commons. When a common resource, such as groundwater, is unmanaged, users will consume it until they are satisfied without considering the negative effects of overuse on other users.[16] The accumulation of these individual decisions often results in the depletion of the resource.[17] Under the Rule of Capture alone, groundwater is an unmanaged common resource. Hardin proposes two alternatives to an unmanaged common resource: privatism or socialism. Hardin claims that while both privatism and socialism have the possibility of success or failure, an unmanaged common resource will always fail.[18] As noted above, groundwater cannot practically or legally be converted into a private good regulated by a market. This leaves socialism, which according to Hardin is when the public "appoint[s] a manager to control its

[16] Garrett Hardin, "The Tragedy of the Unmanaged Commons," in *Evolutionary Perspectives on Environmental Problems*, ed. Dustin J. Penn and Iver Mysterud (New Brunswick: Aldine Transaction, 2007), 105.
[17] Elinor Ostrom, Joanna Burger, Christopher B. Field, Richard B. Norgaard, and David Policansky, "Revisiting the Commons: Local Lessons, Global Challenges," in *Evolutionary Perspectives on Environment Problems,* ed. Dustin J. Penn and Iver Mysterud (New Brunswich: Aldine Transation, 2007), 129.
[18] Hardin, "Unmanaged Commons," 106.

exploitation."[19] The question that remains is *how* should the manager of a public good manage that resource? Hardin gives no specific answer.

Hardin's "socialism" strategy closely represents the current structure of groundwater management in Texas. Through constitutional amendments and legislation, the state has been divided into jurisdictional areas, and the people of those areas have given authority over groundwater to a manager. Yet, the Rule of Capture remains in place. Policymakers have created an inherent conflict between a private property rule and legislation that indirectly limits that rule. This further complicates *how* managers should go about managing groundwater and including public involvement in the decision process.

A BRIEF HISTORY OF WATER PLANNING IN TEXAS

Texas has been formally planning the use of its water resources since approving a constitutional amendment on public water development in 1904. Voters approved the creation of the Texas Water Development Board (TWDB) in 1957, thereby giving the agency the authority to issue bonds for water development and conservation projects. Over the last half of the century, voters approved other constitutional amendments that allowed groundwater conservation districts (GCDs or Districts) to regulate the spacing of wells and how much water the wells may produce through a permit process.[20] Citizens may create a GCD through a local petition.[21] GCDs range in size from several counties to

[19] Hardin, "Unmanaged Commons," 106.
[20] GCDs were first approved by the legislature in the 1949. They steadily gained traction, popularity and more authority through the 1990s. Robert Mace, Rima Petrossian, Robert Bradley and William Mullican, "A Streetcar Named Desired Future Conditions: The New Groundwater Availability for Texas," in *The Changing Face of Water Rights in Texas*, Chapter 3.1 (San Antonio: State Bar of Texas, 2006), 1.
[21] Texas Water Development Board, http://www.twdb.state.tx.us/gwrd/gcd/faqgen.htm#g1 (accessed January 27, 2008).

only a few square miles. GCDs are controlled by a board of local representatives who may choose to hire a professional manager.[22]

The fact that GCDs are small jurisdictional entities whose boundaries do not follow the geological boundaries of aquifers means that different GCDs may seek to manage the same aquifer with different plans and regulations. For example, assume that GCD #1 and GCD #2 are located over the same aquifer. Development is booming in GCD #1, and some stakeholders wish to increase the amount of water pumped from the aquifer. Meanwhile, GCD #2 is not experiencing development pressure and would like to preserve spring flow in a recreational area. Some stakeholders in GCD #2 do not want an increase in pumping from the shared aquifer. These two GCDs seek to manage the same aquifer yet with opposing strategies. This system led to regional conflicts over water management.

In 1998, the TWDB established regional water planning areas to plan development and conservation of both ground and surface water resources in a geographical area.[23] Managed by a coordinating body of local representatives, these sixteen regions span hundreds of miles. (See Appendix A, Illustration 1.) The boundaries are political and do not help resolve the problems presented by planning a regional resource at a localized level.

In 2005, Texas House Bill 1763 (HB 1763) mandated management and planning of Texas groundwater resources on a regional aquifer basis. It formalized entities called Groundwater Management Areas (GMAs or Areas) with borders that follow the geological boundaries of the state's major aquifer systems. (See Appendix A, Illustrations 2 and 3.) The mandate calls for these areas to determine the "desired future condition"

[22] A glossary of terms is found at the end of the appendices to this report.
[23] Texas Water Development Board, http://www.twdb.state.tx.us/about/history.asp (accessed January 27, 2008).

(DFCs) of their aquifer(s) and set goals for water quality, aquifer volume and spring flows.[24] Under this system, neighboring GCDs must work together to develop a management strategy for shared aquifers. Mace writes, "The desired future conditions statements must be adopted by a two-thirds vote of at least two thirds of the districts located in whole or in part in the groundwater management area."[25] Thus, GCDs have the ultimate authority in formulating the desired future condition of the aquifer that then must be approved by the Texas Water Development Board, but they must do so collectively as a GMA. GCDs may develop different DFCs for sub-regions of an aquifer as long as it is approved by the same voting system.[26]

Finally, GCDs have the authority to enforce any rules or regulations under their jurisdiction through fines and orders of injunction.[27] The Texas Commission on Environmental Quality has the authority to take action against GCDs who do not enforce their rules.[28] However, not every area of Texas is incorporated into a GCD. Thus, those areas are subject solely to the Rule of Capture. Even though GCD boards have the authority to regulate groundwater use and trump the Rule, the Rule remains in place.[29] This conflict has been challenged in court multiple times and the Texas Supreme Court has set the precedent of siding with the Districts.[30]

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[24] Texas House of Representatives, *House Bill 1763*, Sec. 36.108d., 79th Legislature, regular session, (Austin, Texas: 2005).
[25] Mace et al., "A Streetcar Named Desired Future Conditions," 4.
[26] Ibid., 4.
[27] Texas Water Code, Section 36.102a-d, http://tlo2.tlc.state.tx.us/statutes/wa.toc.htm (accessed March 30, 2008).
[28] Texas Water Code, Section 36.3011, http://tlo2.tlc.state.tx.us/statutes/wa.toc.htm (accessed March 30, 2008).
[29] "The ownership and rights of the owners of the land and their lessees and assigns in groundwater are hereby recognized, and nothing in this code shall be construed as depriving or divesting the owners or their lessees and assigns of the ownership or rights, except as those rights may be limited or altered by rules promulgated by a district." Texas Water Code, Section 36.002, http://tlo2.tlc.state.tx.us/statutes/wa.toc.htm, (accessed March 30, 2008).
[30] Michael J. Booth and Ross Richard-Crow, "Regulatory Dance: Chapter 36 and District Perspective," in *100 Years of Rule of Capture: From East to Groundwater Management*, ed. William Mullican and Suzanne Schwartz (Texas Water Development Board, June 2004), 24, 31.

OVERVIEW OF THE DESIRED FUTURE CONDITION PROCESS

House Bill 1763 mandates GMAs to determine the "desired future condition" of their aquifer(s), but fails to specify a process for doing so. Managers are to use the DFC to define "managed available groundwater" (MAG), or the amount of water available for permitting. They use this number to set permitting limits within each GMA. The amount of MAG is also used by the State's regional water planning groups. Desired future conditions are intended to "improve groundwater management in Texas by establishing groundwater management plans that allow the GMA to establish regional goals that would help GCDs permit groundwater use on a coordinated basis over shared aquifers."[31]

Once a GMA has decided on its desired future condition, it must submit a proposal to the Texas Water Development Board (TWDB). The TWDB uses models to estimate withdrawals based on the desired future condition and then calculates the amount of managed available groundwater. The MAG is then reported back to the GCDs and to the regional water planning groups. The early decision deadline for a DFC was December 2007. DFCs that were submitted to the TWDB and approved by that time will be included in the 2011 regional water plan. For any GMA that did not make a decision by December 2007, the final deadline for its first DFC is September 2011. The DFC process is iterative; it must be reviewed at least every five years after 2010, but it can be reviewed more often at the discretion of the GMA. Other than the requirement of one public hearing prior to approval, HB 1763 gives no direction as to what criteria should be used to determine a DFC, how often it should be reviewed, or what these processes should entail.

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[31] Ahmed Abukhater, Erica Allis, Anna Bricker, Brenner Brown, Caleb Brown, Leigh Byford, Michael Ciarleglio, et al., "The Future of Groundwater in the Texas Hill Country," ed. Dr. David Eaton, Policy Research Project Working Paper, Groundwater Management in Texas Policy Research Project, (University of Texas, Austin, 2007), xix.

Missing the deadline for submitting a DFC for the Regional Water Plan has consequences. The University of Texas graduate students who worked with GMA 9 note, "Inclusion into a plan is important because a water management strategy excluded from a regional plan may preclude the TWDB from providing money for infrastructure investment to municipalities, water supply corporations, or other water providers with the GCD."[32] There are no other formal consequences from the legislature if a GMA does not turn in a decision on its desired future conditions. However, informal consequences include mismanagement of the resource according to public desires and risk of protest, and lack of scientific evaluation of the aquifer's ability to support those desires. Further consequences from such mismanagement may be felt as negative effects on the regional economy and wildlife habitat.

PROBLEMS WITH DEVELOPING A DESIRED FUTURE CONDITION

So what exactly is a desired future condition and why is it so difficult to determine one? The following six sections explore the inherent complications of this groundwater management policy. Many of these complications are common to other environmental planning and management policy issues.

1. Vagueness and Ambiguity in an Unfunded Mandate

HB 1763 states that GMAs and GCDs must hold any meeting discussing management policy in accordance with open meetings laws. When a DFC is ready to be submitted to the TWDB for review, the GMA must hold at least one public hearing before submission. If a conflict arises regarding the DFC, the GMA is also required to hold at least one public hearing to take comment. The legislation gives no further direction about how GMAs and GCDs should go about deciding upon a desired future

[32] Abukhater et al, "Future of Groundwater," 7.

condition. While this allows the process to be flexible and open according to each GMA's circumstances, it leaves it open to the point of total ambiguity.

Furthermore, the term "desired future condition" is as vague as a legislated phrase can get. It is unclear whether the DFC is referring to volume of water in the aquifer, a rate of spring flow, the amount of drawdown in the aquifer, or the amount of water that may be permitted or withdrawn from a well. It is also not clear whether the DFC should specify different conditions regarding water based on climate, whether it should include water quality conditions, or how far into the future the DFC should go. According to the Texas Water Development Board, "the diversity of desired future aquifer conditions [is] limited only by the creativity of a GMA," and the capacity of a model to compute the meaning of a DFC into managed available groundwater.[33] Any of the previously mentioned options is a possibility. A GMA may interpret future as any period of time – 10, 20 or 50 years, for example. Robert Mace of the TWDB writes, "in essence, a desired future condition is a management goal that captures the philosophy and policies addressing how an aquifer will be managed."[34] If a GMA has more than one aquifer, each aquifer may have its own DFC and any subdivisions of an aquifer may have their own DFCs.

Finally, HB 1763 is an unfunded mandate. This complex process requires communication, education, and negotiation which must be done on a regular basis to achieve success in a timely manner. Area and District board members must travel to conduct meetings to discuss groundwater availability, points of discharge and recharge, and other geological data. Most GMAs cover large geographical areas spanning more than twenty counties and hundreds of miles. If they choose public involvement in the

[33] Abukhater et al, "Future of Groundwater," 4.
[34] Mace et al, "A Streetcar Named Desired Future Conditions," 3.

process beyond one public hearing, they must organize those efforts and pay for any costs. GCDs get most of their funding from ad valorem taxes or levied fees in their districts. Taxes and fees are an unpredictable and contradictory income stream for the GCDs. A downturn in the economy and development can adversely affect a district's funding. For those that collect fees for drilling new wells, the only way to collect revenue to fund the conservation of water is to permit more wells and thus more water use. Most districts have barely enough in the budget to fund the salary of their manager and general operating expenses.

The vagueness and ambiguity in HB 1763 results in managers and board members who have neither direction on where or how to start defining their desired future condition, nor the resources to assist them with their process.

2. Multiple Jurisdictions and Geographical Boundaries

There are sixteen GMAs with boundaries based on those of major aquifers. More than eighty smaller GCDs exist within the GMAs, but their boundaries were formed across geographical and political lines. Though GCDs within a GMA may have differing values about how to engage the public and manage the same shared water resource based on political, economic and geographical variations, the GCDs must agree as a GMA on a desired future condition. Desired future conditions must be set at the Area level based on geological boundaries because an above-ground District political boundary cannot extend underneath to the groundwater. Two neighboring districts, one that wishes to permit more groundwater withdrawals and one that does not, must work together to successfully determine a DFC. Otherwise, the shared groundwater resource will end up as one of Hardin's unmanaged commons.

3. Multiple Stakeholders

Researchers for the collaborative process used in GMA 9 identified at least five general stakeholder groups: the governing GCD boards; county and city officials; agricultural interests including farmers and ranchers; environmental groups that support water and wildlife conservation; and developers building homes and businesses in the region. In some respects, these groups' values differed greatly, even among individuals within the groups. The issues included balancing population growth and conservation, whether and how to limit pumping, and priorities for water use.[35] On other issues such as responsible stewardship of the land and resources, each group fundamentally agreed.[36] While most stakeholders were willing to work together, some expressed a lack of trust toward others. In most cases, the mistrust was directed toward developers for their alleged profit-seeking interest, or toward GCD board members for their alleged misuse of authority.[37] Differences in values and lack of trust made communication difficult in public meetings where GMA 9 actively sought the public's input. These problems would have presented significant barriers had GMA 9 sought agreement from its various stakeholder groups through a consensus building process. Potentially, more numerous or more varied stakeholder groups exist in other GMAs across the state. The scarcer the resource, the more mistrust becomes an issue between water users and managers. Lack of trust among interest groups is often a problem for many types of policy issues and is one of the most important aspects to address in a public engagement process.

4. Inadequate Scientific Data

"Resources that are intrinsically difficult to measure or that require measurement with advanced technology…are difficult to manage no matter what the scale of the

[35] Abukhater et al, "Future of Groundwater," 14.
[36] Ibid., 13.
[37] Ibid., 14, 27, 62, 80.

resource."[38] It would be much easier to manage groundwater if there were sound scientific data and agreement about aquifer levels, recharge and pumping limits, and climate patterns. Not only are geologists unsure about how much water is in various aquifers, or at what rate it will recharge, but GMA and GCD managers do not know exactly how many active wells are in their region and how much water is withdrawn from each. The Texas Water Code states that all wells must be registered and apply for a permit through the local GCD.[39] New wells are registered when the owner applies for a permit; old wells are registered on an ongoing basis. Local authorities have few resources for enforcement of such regulations. Additionally, the Water Code lists three exemptions for well permitting, namely for a domestic well that physically cannot produce more than 25,000 gallons per day, and wells solely for oil or other mining activities.[40] Even though these wells may be registered, these permitting exemptions make it difficult for GCD managers to formulate policy based off numbers because the numbers do not reflect true pumping measures.

5. Demographic Changes

Along with the unknowns such as aquifer levels, drought, and the number of wells, what geologists and managers do know is that increased population growth in many areas of Texas has put pressure on both ground and surface water resources. For example, Central Texas, the Hill Country, and northern Bexar County have experienced dramatic increases in population and development. The population of Williamson and Hays counties increased between 20 and 29 percent from 2000 to 2004. Comal, Kendall and Bandera counties increased between 10 and 19 percent, and Blanco, Gillespie and

[38] Ostrom et al, "Revisiting the Commons," 130.
[39] Texas Water Code, Chapter 36.113, http://tlo2.tlc.state.tx.us/statutes/wa.toc.htm (accessed January 11, 2008).
[40] Texas Water Code, Chapter 36.117, http://tlo2.tlc.state.tx.us/statutes/wa.toc.htm (accessed January 11, 2008).

Kerr counties increased by less than 10 percent over the same period.[41] Areas such as these typically lack adequate surface water resources to supply the needs of the surrounding population, or it is impractical to fund and build infrastructure for surface water.

In addition to increasing use of the resource, migrants to the area often do not have knowledge of the resource or similar values for its use. Public goods theorist Ostrom contends, "[W]hen new users arrive through migration, they do not share a similar understanding of how the resource works and what rules and norms are shared by others."[42] Such uses include urban and domestic use versus rural agricultural use; such norms include excessive lawn irrigation versus conservation. The shift from rural to urban water priorities in Texas due to population growth cannot be emphasized enough. The value differences between historical users and new users create an environment for feuds and perpetuate feelings of mistrust. These consequences of demographic changes increase the difficulty of managing groundwater.

6. Public Information

Finally, the lack of public knowledge about hydrogeology and aquifers, water conservation and the desired future conditions process present another barrier to public involvement in the DFC process as well as management strategies for a DFC. It is tough to engage people on a subject they know little about and elicit their values. A repeated mantra of almost every stakeholder in the GMA 9 public involvement process was for the GMA and GCDs to do more to inform the public about groundwater issues and management through the media and schools. The limited financial and human resources of GMAs make this difficult.

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[41] United States Census Bureau, "Texas Population Estimates," http://www.census.gov/Press-Release/www/2005/tx_popchange2004.pdf (accessed March 1, 2008).
[42] Ostrom et al, "Revisiting the Commons," 134.

THE NEED FOR EVALUATION OF PUBLIC INVOLVEMENT PROCESSES IN GROUNDWATER MANAGEMENT

Despite the various shortcomings of the desired future conditions process, it can be an effective instrument if managers have the right resources and take action to address the shortcomings rather than shy away from them. Otherwise, GMAs may fail to meet legislated DFC deadlines, and the resource may not be managed according to public needs and desires. Potential consequences are not putting the resource to its most valued use resulting in legal challenges and, especially in the case of severe drought or overpopulation, running out of water.

Why should the public be involved in the planning of a common resource? The obvious answer is that a public resource ought to be managed according to the public's preferences. What if members of the public have different preferences? What if members of the public have difficulty forming a preference because they lack sufficient information about the resource? A movement/theory called deliberative democracy posits that it is the responsibility of citizens to participate in their democracy, and that provided information and an opportunity for meaningful input and deliberation, ordinary citizens – not just experts or policymakers – can indicate their preferences and make reasonable and legitimate recommendations about public policy issues.[43] Public hearings are insufficient as the bare minimum for public involvement in a policy issue such as groundwater management. GMAs need an adequate, practical and integrative method for public and stakeholder involvement in groundwater management and planning so that they may determine a desired future condition that results in a managed rather than an unmanaged common resource. The analysis of the strengths and weaknesses of several processes will

[43] John Gastil, "A Nation That (Sometimes) Likes to Talk: A Brief History of Deliberation in the United States," in *The Deliberative Democracy Handbook*, ed. John Gastil and Peter Levine (San Francisco: Jossey-Bass, 2005), 3.

determine the most practical method for achieving public involvement that elicits useful information.

The definition of "public" in public involvement must be made clear and distinguished from the definition of stakeholders. Property owners with active wells and people without wells but who otherwise use water from aquifers have a direct stake in the planning, management and use of groundwater. This report refers to these individuals or groups as direct stakeholders and should be included in the planning and management process. But because groundwater is a quasi-public good, managers should also attempt to include the general public who may derive direct or indirect use from that groundwater, regardless of their knowledge of the subject or their frequency of the direct or indirect use. How that public input will be solicited and used by GMAs remains variable across processes and will be explored in later chapters. Moreover, for the purposes of this report, the words involvement, engagement, participation and input are considered synonymous.

In regard to public involvement, the law states that any meeting held within a GMA must be in accordance with the state open meeting laws and that an Area is obligated to hold at least one public hearing before a desired future condition is approved.[44] The sixteen GMAs and the eighty-nine smaller GCDs follow these minimum requirements and generally shy away from additional public input methods. To assess what additional input methods are being used across the state, the methodology consisted of sending a questionnaire to each GMA. (To review a blank questionnaire, see Appendix B).

GMA 9 in the Texas Hill Country used a collaborative process by holding 10 to 15 open meetings, six open information sessions, and interviewing about 30

[44] Texas House, *HB 1763*, Sec. 36.108n.

representatives of five stakeholder groups. University of Texas graduate students and Center for Public Policy Dispute Resolution staff acted as neutral facilitators and researchers during this process. Several barriers slowed down the process of reaching a decision: a significant lack of trust among the stakeholder groups and between the stakeholder groups and the GMA/GCD boards; a critical lack of public knowledge about the DFC process and water conservation; and insufficient scientific data about the six major and minor aquifers in GMA 9. Despite these barriers, GMA 9 reports that the information it received from the public during the process was "extremely useful."[45] The public input was incorporated into two DFCs that are still pending approval of the TWDB and the final GMA vote. GMA 9 plans to review its DFC at least once per year and seek public input for that review.

Answers to the questionnaire revealed that some other GMAs utilize websites and local media to share information. One GMA reported holding meetings with stakeholders while another reported mailing out a survey. Seven of the ten GMAs that responded reported a sense of urgency regarding groundwater management in their Area, and GMA 2 reported a sense of "concern."[46] Among the GMAs, reported reasons include population growth, agricultural industry, pressure to sell water to other regions or corporations, and subsidence.

Using groundwater as a case study, this chapter demonstrated the complexity of environmental policy issues and the need for evaluation of several public involvement processes to achieve a decision that will be accepted, not challenged, by the various interests. This report will pick up where Hardin and the State legislature have left off and explore the strengths and weaknesses of several public input processes and evaluate them

[45] Ron Fieseler, GMA 9 questionnaire, February 26, 2008.
[46] Jason Coleman, GMA 2 questionnaire, March 3, 2008.

as they apply to groundwater management in Texas. While HB 1763 requires at least one public hearing, this minimal level of public involvement is not conducive to sound groundwater planning. Traditional public hearings have several weaknesses, namely self-selection biases, a lack of information sharing, and little opportunity for meaningful dialogue. As stated in Chapter 1, the management of public and quasi-public goods, such as groundwater, requires much more flexible public engagement processes that actually allow meaningful public input as well as adapt to multiple jurisdictions, resources, stakeholder groups, and complex scientific data. Additionally, the more the public is involved in the decision process the less likelihood of legal challenges to implementation after a decision is reached.[47]

[47] Kim Kovach, "Introduction," in *The Handbook of Alternative Dispute Resolution*, ed. Greenspan (Austin: State Bar of Texas, 1990), 14.

Chapter 3: Policy Alternatives

In the United States, government agencies and stakeholders increasingly employ several types of alternative dispute resolution techniques for environmental planning, management and conflict resolution. A broad base of literature examines the best methods for public involvement and soliciting the preferences of diverse communities. A questionnaire was sent to each of the sixteen GMAs asking for information about the nature, frequency and progress of their public involvement process to craft a desired future condition. Of the ten GMAs that responded to the questionnaire, all ten reported using the traditional and legislated open meetings and public hearings to seek public input. Some reported utilizing websites, local media, stakeholder meetings and surveys. What other alternatives to these methods could be used without violating the statute? This chapter summarizes and compares three commonly used methods – open meetings, public hearings, and consensus building. It also introduces one lesser utilized method – citizens juries.[48]

Some common alternative dispute resolution methods such as mediation and arbitration are not examined in this report. These methods are best suited for private disputes between two parties and may not be suited for cases which involve multiple parties and common pool resources. Public input through surveys is also beyond the scope of this report.

This chapter describes the methodology of this report, details the qualitative and quantitative criteria used to evaluate the public involvement processes, and summarizes each of the four processes. The chapter concludes with the preliminary finding that

[48] The description and historical background of the citizens jury method is of greater length because it is a lesser known process in Texas.

increasingly satisfying the qualitative criteria tends to negatively impact the quantitative criteria, suggesting if financial and temporal resources are limited a hybrid of traditional and contemporary methods may be necessary to have an adequate process without exhausting resources.

METHODOLOGY

The processes examined in this report are evaluated on several criteria subdivided into qualitative and quantitative categories. Some criteria were adapted from the literature on the processes. Others were adapted from the field work in GMA 9 and the responses to the questionnaire for groundwater managers. They are all important factors in common resource planning – particularly groundwater in the context of the Texas Legislature's planning rules. The criteria are also meant to be useful for evaluating other public involvement processes that are beyond the scope of this report and they are relevant to the challenges any public official or manager faces with involving the public in other policy issues.

Qualitative Criteria

The first criterion is whether a process actually helps managers elicit *informed* input. How the public input will be used must be made clear in the beginning; i.e. will participants in a process make the final decision or will they make advisory recommendations and the governing body will make the final decision?[49] Either way, input from someone who knows little about the resource or the policy issue, especially a complex or technical issue, may be useless because the suggested action could be impractical in the context of the situation. Some might argue that if an individual or

[49] David Konisky and Thomas Beierle, "Innovations in Public Participation and Environmental Decision Making: Examples from the Great Lakes Regions," *Society & Natural Resources,* Vol. 14 Issue 9, (Oct 2001): 817.

group provides input on a subject then it must be informed of the subject on some level. With the exception of survey methods, this may be true. However, whether the public is informed on the matter and to what degree will vary unless the governing body makes an effort to provide some information. On the other hand, the elicitation of *values* may be useful and people can have values about an issue without technical knowledge.[50] The best input is not passively received on a survey sheet or at a public hearing. It is sought through dialogue between the governing body and the public, through deliberation between various public interests. Deliberative democracy literature contends methods that utilize two-way communication produce outcomes that are more acceptable to all interests.[51] Participants and governing bodies are better able to prioritize values concerning the resource *and* formulate action steps to meet those values when they have the same base body of information.[52]

Developing trust in the process is the second qualitative criterion. It has four sub-categories – transparency, neutrality, representation and buy-in. Bias, the lack of transparency, and leaving out one or several interests can taint a public process. Fostering an atmosphere of trust is the only way to get people to work together, to communicate openly, and to reach the best outcome. First, public input means nothing if the governing body or sponsor of the process does not buy into the process or commit on some level to the outcome of the process. [53] Without commitment of the sponsor, other participants may act differently or provide less candid input if they perceive they will not be taken

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[50] McKinney and Harmon, 160.
[51] Konisky and Beierle, "Innovations," 822.
[52] Ibid., 822; Susan Carpenter, "Choosing Appropriate Consensus Building Techniques and Strategies," in *The Consensus Building Handbook,* ed. Lawrence Susskind, Sarah McKearnan and Jennifer Thomas-Larmer (Thousand Oaks: Sage Publications, 1999), 81.
[53] Policy Consensus Initiative, *A Practical Guide to Consensus*, (Santa Fe, New Mexico: Policy Consensus Initative, 2002), 2.

seriously, not to mention the entire process would be a waste of resources.[54] Equally important, participants must buy into the process and commit to the outcome. Participant buy-in is more likely when the other sub-criteria – transparency, neutrality, and representation – are met.[55]

Most public governing bodies meet the transparency criterion because they must follow open government or "sunshine" laws in this state. Because it is impossible to eliminate personal bias, creating a neutral environment necessitates employing a neutral facilitator in any process.[56] Whether paid or a volunteer, a third party without a stake in the outcome or a role in the decision can provide organization and referee intense issues.

Third, many open collaborative processes are subject to self-selection bias, the fact that participants have opted or volunteered to partake without being asked. While it is commendable that citizens volunteer their time and effort to participate in a process, the problem here is that they may not be representative of the general public or of all the possible interests.[57] Facilitators and sponsors must make an effort to correct for the self-selection bias by ensuring representation of all interests.

Finally, the flexibility of the process is a key to its success in meeting many of the quantitative and qualitative criteria. The ability to adapt to situational characteristics such as temporal, geographic, scientific and cost constraints, as well as the number of people involved, makes a process more useful across a range of resources and public policy issues. The consistent use of one process is another way to spread information and build trust. Flexibility also makes it possible to blend methods together for hybrid processes

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[54] Wendy Kenyon, "Enhancing Environmental Decision-making Using Citizens Juries," *Local Environment*, Vol. 8 Issue 2 (April 2003): 229.
[55] PCI, *A Practical Guide*, 2.
[56] Carpenter, "Techniques and Strategies," 67-68; Chris Carlson, "Convening," in *The Consensus Building Handbook,* ed. Lawrence Susskind, Sarah McKearnan and Jennifer Thomas-Larmer (Thousand Oaks: Sage Publications, 1999), 181.
[57] Robert E. Goodin, "Deliberative Impacts: The Macro-Political Uptake of Mini-Publics," *Politics & Society*, Vol. 34 Issue 2, (Jun 2006): 222; Konisky, "Innovations," 815.

that are best suited for the issue but that do not violate statutory requirements for transparency or minimum input.[58]

Quantitative Criteria

The more a process satisfies the qualitative criteria, the more likely it is to take longer to plan, produce and finish. The quantitative criteria cost, time and location are of no less importance than the qualitative.[59] In fact, they may be the most important constraints on planners and managers. Chapter 2 noted the funding constraints on groundwater Districts and Areas. If the cost of a process is too prohibitive, its qualitative strengths bear little relevance. The pressure to meet deadlines or act in a sense of urgency can obscure the benefits of taking more time. Finally, logistical problems stemming from a large geographical area can increase cost and time. Having reviewed the criteria to evaluated public involvement processes, the following sections describe several processes and their strengths and weaknesses.

OPEN MEETINGS

An open meeting is one that is open to the public because a majority of a governmental body is present where "public business or public policy over which the governmental body has supervision or control is discussed or considered or in which the governmental body takes formal action."[60] The governmental body must give the public notice of the meeting and hold the meeting in a central location. By statute, it is optional for the governmental body to address the public or seek input from the public during the meeting. The purpose of an open meeting is to promote transparency in government. Anyone can attend, including media. Anyone who cannot attend a public meeting can

[58] Kovach, "Introduction," 11.
[59] PCI, *Practical Guide*, 2; Carpenter, "Techniques and Strategies," 69, 96-97.
[60] State of Texas Government Code, Chapter 551, Open Meetings, http://tlo2.tlc.state.tx.us/statutes/gv.toc.htm (accessed January 11, 2008).

request copies of records such as agendas and minutes. Other than transparency and flexibility, open meetings do not meet any of the other qualitative criteria, but they are a building block for public engagement, allowing the public to witness discussion and decision making. The obvious quantitative advantage of open meetings is that they are inexpensive, place no additional time burdens, and are already held at a central location.

PUBLIC HEARINGS

A public hearing is an open meeting where the governmental body actively solicits citizen testimony or comment on a matter of public business or public policy. Public hearings are used widely to take comment on many public issues, including resource management and environmental planning. For example, the Texas Commission on Environmental Quality uses public hearings in its pollution permitting programs.[61] State law specifies little in the way of regulation of these hearings, and the rules are left to Districts and Areas to carve out themselves.

Relative to other methods, public hearings are fast and cheap. Taking only a few hours, and costing virtually nothing, the hearings are an easy and transparent way to seek input for or against an issue. Like open meetings, there are several weaknesses. Primarily, the traditional concept of a public hearing indicates there is a one-way line of communication from a participant to a governing body, not a dialogue. This one-way method of communication does little to foster trust among the public and decision makers. The inherent self-selection bias of those who attend the hearing to voice opinions is also a limitation. Only those who make the time commitment to attend the meeting are heard. Although the public is permitted to write letters to the governing body if they are unable to attend the meeting, some interests may still go unrepresented. The level of

[61] Texas Commission on Environmental Quality, http://www.tceq.state.tx.us/comm_exec/opa/pub_part.html (accessed September 9, 2007).

knowledge on the subject can range from minimal to great, but decision makers cannot necessarily separate out informed comments from uninformed.

A less obvious advantage is the flexible nature of a public hearing, which could correct for some of the disadvantages. A governmental body could elect to first address those in attendance and share information. They could ask questions and foster dialogue. Depending on the sensitive nature of the policy issue and level of trust, the meeting might need to be structured and possibly hosted by a neutral facilitator. Chapter 4 further explores the implications of the flexibility of public hearings and open meetings, including benefits and the necessity of meeting statutory requirements in the DFC process.

CONSENSUS BUILDING

Overview of the Process

Consensus building is defined as "an effort in which government agencies and other affected parties seek to reach agreement on a course of action to address an issue or set of related issues."[62] A decision is made by agreement of all parities rather than by majority vote. Because all parties are in agreement as to the decision, they pledge not to attempt to obstruct the agreement or its implementation. The Policy Consensus Initiative group writes, "Consensus outcomes can build the broad support necessary to carry out actions that would otherwise be difficult to enforce."[63] Thus, the first objective of consensus building is for the parties involved, including the sponsor and the stakeholders, to buy into the process. A sponsor is an entity "willing to support and endorse the use" of a process.[64] A typical example is a governing body such as a GMA board, but private

[62] PCI, *A Practical Guide*, 2, 5, 6.
[63] Ibid., 8.
[64] Carpenter, "Techniques and Strategies," 94.

parties such as not-for-profit or for-profit organizations could be sponsors of a consensus process. Stakeholders then are the remaining parties with an interest in the outcome of the process and the final decision made by the sponsor.

The sponsor and the stakeholders work together to set their own guidelines for the process in the beginning. "Ground rules should be mutually agreed upon by all participants and not established solely by the sponsoring agent."[65] The sponsor contracts with a neutral facilitator to conduct an assessment of the issue, ensure that all parties who should participate are invited to do so, and work with all parties to design the process and determine the rules. The assessment typically entails research on the historical context of the policy issue as well as interviews with the governing body, stakeholders, and others referred to the process.[66]

Participants in consensus building are generally individuals who believe they can represent the interests of a group with similar values. The key point in the last sentence is the word "interests." In consensus building, participants are not asked to share just their position. Positions, such as no increase in groundwater pumping, can be shared in any public input method. In consensus building participants must explain the interest, such as concern for the impact of widespread drought, behind the position so that common interests are identified and addressed. As noted in Chapter 2, many of the adversarial stakeholder groups actually had common interests. As part of the ground rules determined in the beginning, participants must also decide how they will communicate with the constituents that they represent.

Other important steps in the process include to: [67]

- Make logistical choices such as a timeline and location(s),

[65] PCI, *A Practical Guide,* 2.
[66] Carpenter, "Techniques and Strategies," 64.
[67] Bulleted list paraphrased from Carpenter, "Techniques and Strategies," 76-93.

- Keep record of the process and the outcome for clarification and transparency,
- Seek the advice of technical experts to explain complex data and answer questions, when necessary,
- Evaluate the process midway and at the end to reflect on what was successful, unsuccessful and why.

Like public hearings, consensus building is used for many public policy issues, including resource management and environmental planning cases. Sometimes consensus building is used in informal settings such as a neighborhood deciding on the permitted uses of an outdoor trail (walking, running, bikes and dogs). In other cases, consensus building has become a much more formal process. Several northern states have popularized a process called Coordinated Resource Management (CRM).[68] In this process, stakeholders of a natural resource use consensus to reach a decision in conjunction with a governmental regulatory body. Originating with the Soil Conservation Service and the Nevada Association of Conservation Districts in the 1950s, CRM was specifically developed to address natural resource planning conflicts.[69] Stakeholders learn how to express their interests rather than their positions and work together toward an outcome that all team members support. Francher writes, "The whole community participates in shared decision making, which produces the best and most widely-endorsed plans."[70] A neutral facilitator aids in the process, and participants are volunteers. The end results are management objectives and action plans to achieve the identified desired goal.

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[68] States with CRM groups include California, Colorado, Montana, Nevada, Oregon, South Dakota, Washington, and Wyoming. The Society for Range Management, http://www.rangelands.org/education_crm.shtml (accessed January 22, 2008).
[69] Ibid.
[70] Susan Francher, "CRM in New Hampshire," in *A Resource Manual for Coordinated Resource Management*, ed. Carol Kruse (Wyoming Department of Agriculture, 1997).

As an example, much like statewide water planning in Texas, for decades New Hampshire has required statewide forest planning to address land ownership issues, determine the future of forests, and develop policies for management.[71] The John E. Sargent State Forest agency used Coordinated Resource Management and a steering committee of stakeholders to develop the future vision of the forest and decide on action items to achieve that vision. The resulting report, "Vision of New Hampshire's Forest Resource: The Desired Future Landscape Condition," was submitted for public review, revised, and used to assess the forest's current condition and work toward the future condition.[72] The Wyoming Department of Agriculture and the Society for Range Management publish materials on CRM and offer training and assistance for CRM projects in other states.[73]

Strengths and Weaknesses

The consensus building process has several strengths. Neutral facilitation builds trust and fosters an atmosphere of transparency. To be successful, consensus building requires commitment from those involved, both sponsor and stakeholder buy-in. Since participants agree on the rules before even talking about the public policy issue, the process is flexible. For example, the sponsors and parties can decide on how often to meet and whether the outcome is binding or non-binding. In other words, the consensus group may make the final decision, or they may formulate a recommendation that is then considered by the sponsor/governing body. The flexible nature of designing the process also leaves room for informing participants on the process or the issues if everyone is not at the same knowledge level. Even if participants feel they can accurately represent the interests of one group, it does not mean that the participant is well informed about all

[71] Francher, "CRM in New Hampshire."
[72] Ibid.
[73] Kruse, "A Resource Manual for CRM."

issues related to the case. Ideally, the consensus process itself will spread information, but due to constraints on time and financial resources, the sponsors may not have the opportunity to ensure everyone is fully informed. The assessment also helps eliminate the self-selection bias by ensuring all potential interests are invited to participate and be represented.

Compared to open meetings and public hearings, consensus building processes satisfy more qualitative criteria. One qualitative disadvantage that is a subset of flexibility may be of concern for sponsors and participants. While the fact that several parties have come together to collaborate may present a larger range of possible outcomes, by definition parties must compromise to reach a decision when using consensus building. In some cases, a compromise may not be in the best interest of the public, the parties involved, or the resource in question. Full exploitation or full conservation may be best. Before agreeing to a consensus building process, parties must analyze what type of outcome will be in their best interest.

Unlike open meetings and public hearings, quantitative disadvantages are more prominent. Depending on the complexity of the issue and number of stakeholder groups involved, planning and convening a consensus building process often takes weeks or months. Using one or several professional neutral facilitators to foster trust and transparency can cost from $100 to $200 per hour.[74] Finally, depending on the span of the geographical area relevant to the case, location and travel logistics can present a problem. Governing bodies pressed for time and money may not consider this process viable.

[74] Joan Calcagno, U.S. Institute for Environmental Conflict Resolution, e-mail communication, February 20, 2008.

CITIZENS JURIES

Overview of the Process

Political scientist Ned Crosby developed the trademarked Citizens Jury process in the 1970s.[75] He founded a think tank called the Center for New Democratic Processes, and it later became the Jefferson Center.[76] A typical Citizens Jury process entails the agreement of a sponsoring agent to consider the recommendations of a group of regular citizens regarding a policy issue. A sponsor could be a government body such as a group of County Commissioners, an interest group such as a neighborhood association, or a regulatory body such as a transit authority.

An advisory committee works with the sponsor, stakeholders, and neutral facilitators to research the background of the issue, develop a charge for the jury, and select the witnesses and jurors.[77] The advisory committee may be made up of members of the sponsoring organization, issue experts from outside the jurisdiction, and community leaders. In developing the charge for the jury, the advisory committee must decide what questions need to be answered in the jury's recommendations. Within the U.S. cases, charges were often split into three parts, asking the jury to articulate and prioritize values, develop strategies, and recommend action steps regarding the particular policy issue.[78]

Witnesses are selected based on subject matter expertise and must capture the full range of information and opinions on the policy issue. Witnesses may range from not-for-profit advocacy groups, to industry representatives, to staff workers within the sponsoring agency. Finally, a jury pool is selected randomly by telephone or mail, and after a brief interview process twelve to twenty-four jurors are selected to participate. This planning

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[75] Jefferson Center, "About Us," www.jefferson-center.org (accessed November 2, 2007).
[76] Ibid.
[77] Jefferson Center, "Process," www.jefferson-center.org (accessed November 2, 2007).
[78] This paragraph summarizes information found in Crosby's five Citizens Jury reports on environmental cases. Further information on these reports may be found in the appendices and references sections.

part of the process can take from a few weeks up to several months, depending on the complexity of the policy issue and the number of parties involved.[79]

When all components are set in place, the jury assembles and witness presentations begin. The presentation to the jury lasts five days, typically enough time to address the policy issue without overburdening the participants. Jurors are compensated for their time. After each presentation, the jury is allowed to ask questions of each witness. At the end of each day and on the final day, jurors deliberate amongst themselves in private and write a recommendation in their own words. The recommendation is then presented to the sponsor, and the jurors evaluate the process to provide feedback.[80]

The purpose of the Citizens Jury process is to "empower a microcosm of the public to deal effectively with complex issues."[81] The underlying theory is that given ample time and information, a sample of the general population will make reasoned and legitimate recommendations or decisions regarding a particular issue. Crosby lists seven elements that are essential to the success of the Citizens Jury process: [82]

1. Microcosm of the community: randomly selected citizens will adequately represent the demographics of the population, not just special interests;
2. Size: the jury should consist of as large a number as possible without becoming unwieldy. The Jefferson Center recommends twenty-four;
3. High-quality information: witnesses representing stakeholder groups should present their own views to the jury, not through the third party facilitator. Jurors should be allowed time to question witnesses directly;

[79] This paragraph summarizes information found in Crosby's five Citizens Jury reports on environmental cases. Further information on these reports may be found in the references section.
[80] Jefferson Center, "Process," www.jefferson-center.org (accessed November 2, 2007).
[81] Ned Crosby and Doug Nethercut, "Citizens Juries," in *The Deliberative Democracy Handbook*, ed. John Gastil and Peter Levine (San Francisco: Jossey-Bass, 2005), 112.
[82] Ibid., 113-114.

4. High-quality deliberation: facilitators must organize the process in a way flexible enough for jurors to ask questions of each other during deliberations while structured enough that the process remains on track and no one person controls the discussion;
5. Minimize bias and outside manipulation: facilitators must be neutral and jurors should be able to "express their final recommendations in their own words;"
6. Fair agenda and hearings: an outside advisory group should select witnesses and set the proceeding agenda;
7. Sufficient time: five days is the norm because it is long enough to explore complex issues but short enough to make the process attractive to participants.

Additional important pieces include: [83]

- building in an introductory period at the beginning to familiarize the jury with the process and a general overview of the policy problem;
- building in an evaluation period at the end for jurors to evaluate the process, especially facilitator neutrality;
- reaching agreement with the sponsoring agent to at least consider if not accept the jury's recommendations;
- extending the public engagement process beyond the jury through media attention and a web presence.

From the 1970s through the 1990s, the Jefferson Center conducted Citizens Juries at the local, state and national level on many topics including education, health care, tax reform, and elections.[84] The Jefferson Center published five cases of Citizens Juries

[83] Bulleted list paraphrased from Crosby and Nethercut, "Citizens Juries," 115; and Jefferson Center, "Current Activities" and "Process," www.jefferson-center.org (accessed November 2, 2007).
[84] Jefferson Center, "Projects," www.jefferson-center.org (accessed November 2, 2007).

conducted on issues related to environmental planning. The summary of one case is provided here as an example. The remaining summaries are found in Appendix C.

In 2001, several governing agencies in the Minneapolis region grew concerned with the challenge of disposing of increasing tons of solid waste over the next 15 to 20 years due to population growth. The Twin Cities Solid Waste Coordinating Board, made up of metro area county commissioners, sponsored a Citizens Jury to advise on strategies for managing regional solid waste that satisfied the economic, environmental and public needs.[85] This case illustrates the pattern in charges to the jury to establish values, strategies and action steps regarding the policy issue. The charge in this case was:

1. What are the values, in order of priority, that should be reflected in a solid waste management strategy for the metropolitan area?
2. Given those prioritized values, what is the preferred solid waste management strategy for the metropolitan area?
3. To implement the preferred strategy, what tools should be used and what (if any) actions should be taken by government or others?[86]

The jury's 25 pages of recommendations prioritized six major values for a solid waste strategy, identified efforts toward reduction and reuse of solid waste as the preferred method out of five possible management strategies, and communicated more than 50 actions that could help the Board, the private sector and the public to achieve the preferred strategy.

International Variations of the Citizens Jury

While Crosby developed the citizens jury process in the U.S., political science professor Peter Dienel simultaneously developed a similar Planungzellen or "planning

85 Ned Crosby, *The Citizens Jury on Metro Solid Waste Final Report*, (Minneapolis, MN: The Jefferson Center, 2001), 1.
86 Ibid., 3.

cells" process in Germany. The German government provided funding and commissioned Dienel and his Research Institute for Citizen Participation to hold planning cells on a multitude of policy issues. In the beginning, issues were focused at the local level, but now regional and national issues are included. In contrast to Crosby's preferences for keeping juries small and contained, Dienel usually holds multiple juries of 25 at the same time in different regions.[87] Juries are also held successively on the same issue. Since jurors are randomly selected, no one group can claim to have been "systematically excluded."[88] As a result, there is little public resistance claiming that the process and outcome are not representative of the community and its views.

Since the Institute for the Public Policy Research of London began advocating the citizens jury process in the 1990s, the process has been used hundreds of times in the United Kingdom, particularly surrounding issues of health policy and environmental planning for wetlands and waste management.[89] Support for the process comes from top government administrators down to the local level.[90] The skeleton of the process remained the same, however, several adaptations have been documented including three days with the jury instead of five, fewer number of staff facilitators, and the recommendations not written entirely by jurors but with help from or totally by staff and advisors.[91] Presumably, these adjustments were made to reduce time and costs.

Other adaptations have been proposed or experimented with by U.K. researchers. In the inter-jury forum, two juries meet separately to hear testimony, deliberate and make

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87 Smith and Wales, "Citizen Juries," 56.
88 Ibid, 57.
89 Wendy Kenyon, Nick Hanley, and Ceara Nevin, "Citizens Juries: An Aid to Environmental Valuation?" *Environment and Planning C: Government and Policy*, v.19, iss. 4 (August 2001): 558.
90 Clare Delap, "Citizens Juries: Reflections on the UK Experience," *PLA Notes 40*, (February 2001): 39.
91 Etham Kashefi and Maggie Mort, "Grounded Citizens Juries: A Tool for Health Activism?" in *Health Expectations*, Vol 7, Issue 4, (Dec 2004) :294, 297; Petts, Judith, "Evaluating the Effectiveness of Deliberative Processes: Waste Management Case-studies," *Journal of Environmental Planning & Management*, Vol. 44 Issue 2, (Mar 2001): 220; and Kenyon, "Aid," 560-561.

recommendations. One jury consists of randomly selected citizens from the community, and the other consists of direct stakeholders in the outcome. The two juries then meet together to formulate recommendations for the sponsor.[92] In the case where this adaptation was carried out, the stakeholder jury was not satisfied with the process or the outcome. However, the author claims that this may have been due to the nature of the issue considered by the juries – that it was not a "ripe" issue of importance – rather than the process itself.[93] Other criticisms were that the process was too time consuming and expensive since each aspect was essentially carried out three times.[94]

Another adaptation is the network jury. In response to a call by the European Union to use citizens juries in the Water Framework Directive (WFD), Kenyon proposes a network of juries to accommodate the complexities of the water resource management process.[95] A similar modification was made in the Agriculture and Water Quality jury process in the U.S. in 1984. The fact that the river basins cover a large geographic area, cross political and administrative boundaries, and that the WFD process is a long-term planning process, the normal citizens jury format of twelve to twenty-four people making recommendations in one week was not ideal.[96] However, Kenyon proposes creating a network of juries across each administrative jurisdiction that is held regularly every six months or year.[97] Kenyon also advocates transparency in every aspect of the process and seeking as much media attention as possible in order for the larger public to accept it.[98]

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[92] Delap, "UK Experience," 40.
[93] Ibid, 41.
[94] Ibid, 41.
[95] Wendy Kenyon, "A Critical Review of Citizens Juries: How Useful Are They in Facilitating Public Participation in the EU Water Framework Directive?" *Journal of Environmental Planning and Management*, v. 48, iss. 3, (May 2005): 431.
[96] Ibid., 438.
[97] Kenyon, "Critical Review," 439.
[98] Ibid., 436.

Open juries are a third adaptation. Ward suggests that to truly achieve legitimacy and accountability the citizens jury process should be as open and transparent as possible.[99] Open juries encourage wider social learning and connections to political processes.[100] "[Open juries] may help to build new horizontal relations of trust within communities and vertical linkages with experts."[101] Ward gives five elements to an open jury:

1. An agenda arrived at through open consultation;
2. An open witness policy;
3. An extended time frame;
4. A critique of rationalistic forms of debate;
5. Use of information technology to address problems associated with access and cost.[102]

Ward recognizes that there are potential problems with such an open jury. For example, if the process is open for anyone to be a witness, disparities could arise in resources to gather and present information to the jury.[103] Additionally, the use of internet technology to facilitate the open forum introduces problems of access (though most people have access to internet, not everyone does), self-selection (whereas jurors are selected randomly, those visiting the website have sought out to do so), and cost (employing technology and staff who can set up and maintain it can be expensive).[104]

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[99] Hugh Ward, "Open Citizens Juries and the Politics of Sustainability," *Political Studies*, Vol. 51 Issue 2, (Jun 2003): 285, 288.
[100] Ibid., 290.
[101] Ibid., 285.
[102] Ibid., 283.
[103] Ibid., 290.
[104] Ward, "Open Juries," 290-291.

Strengths and Weaknesses

Citizens juries meet all three qualitative criteria. Rather than yes or no answers from an anonymous poll or limited comment from self-selected stakeholders at a public meeting, the output of a citizens jury includes prioritized values and action steps.[105] The process utilizes neutral facilitators to minimize bias, and its use abroad demonstrates its flexible nature. Sponsors should be open to the process because the decision is non-binding, they are likely to receive more and better ideas related to the outcome than if they acted on their own, and as Goodin suggests they can view the process as "market testing," whether or not the sponsor can sell a policy to the people.[106] With citizens juries, by taking that decision process out of the hands of the direct stakeholders, the range of outcomes becomes wider. The jury could recommend a decision focused on one policy option or another, or some combination of any or all of the options.

There are some inherent disadvantages of citizens juries and but there are also potential ways to overcome them. One of the first key problems with citizens juries is legitimacy and accountability. Citizens juries lack formal authority, and critics argue that the recommendations are illegitimate and lack significance.[107] Jurors are not elected or appointed like public officials, or identified in an assessment like consensus building participants. Instead, jurors are randomly selected. The goal is for those selected to be as representative of the population affected by the issue as possible. Kenyon posits that it is difficult to achieve statistically significant representation of a population through random selection or moderated selection, but that there is no doubt that once informed those selected make intelligent decisions for their community.[108] Kenyon goes on to say that

[105] Goodin, "Deliberative Impacts," 227.
[106] Ibid., 230.
[107] Ibid., 224.
[108] Kenyon, "Critical Review," 433.

media coverage, transparency, internet presence and non-binding recommendations mitigate legitimacy and accountability problems.[109] Through these other measures, citizens who were not selected to be part of the process still have access to the information and, depending on the level of input allowed, may be able to voice their own opinions to jurors and decision makers. The non-binding nature of the outcome alleviates risk for stakeholders and decision makers because if they believe the jury's recommendations are truly unsound, then they do not have to consider them.

Furthermore, depending on the issue before the jury and the level of trust among differing stakeholders and the sponsor, stakeholders may be reluctant to put influence on decisions in the hands of the general public. Stakeholders may feel that the decision at hand is not for the public to make, or they may fear that the jurors will be co-opted by the sponsor(s) and any bias they may have. The more that the issue before the jury relates to a public good rather than a private good, the less likely the occurrence of the former feelings. The fact that the citizens jury process emphasizes information sharing, reason, and deliberation means the opportunity for co-optation of participants is unlikely.[110]

While qualitative disadvantages are easily overcome, the quantitative disadvantages are not. The length of time for the entire citizen jury process and the total cost depend on several factors. First, the scope of the project influences how much preparation time is needed by the sponsor, advisory committee and facilitators. The more complex the policy problem, the more time will be needed. Second, this length of time, plus the number of staff, the number of jurors, and how much the jurors are compensated for their time affect the total cost of the project. Of the case studies reviewed, the time

[109] Kenyon, "Critical Review," 436.
[110] Ibid., 437.

ranged from about three months to one year. Costs are not reported with each case study, but the Jefferson Center states that total costs range from $35,000 to $90,000.[111]

Another concern, especially with cases of environmental or resource planning, is that scientific data will be too numerous and too complex for the jurors to comprehend within five days. The Jefferson Center faced such concerns with the case of Environmental Risk in 1996 and presentations about specific sources of pollution and their potential effects.[112] The key to overcoming this problem is for the advisory committee and witnesses to adequately summarize the data and find ways to explain it in lay terms.

ANALYSIS AND CONCLUSIONS

The four processes just described represent a range of options available, from the extreme minimum of open meetings to an extreme maximum deliberative process such as the citizens jury. These processes are not exhaustive of all those available, but illustrate the range without overwhelming this report.

Review of these public input processes reveals that the qualitative and quantitative evaluation criteria are inversely correlated. One of the principles of ADR processes is that they save the parties involved both time and money compared to traditional conflict resolution processes. However, in the case of conflicts in environmental planning and management, whether or not the process employed saves time or money is relative, depending on the circumstances of the case, the alternative methods possible, and opportunity cost of those resources. Whether sponsors choose any of the four processes, the time needed to engage the public and reach a decision will

111 Jefferson Center, "FAQ," www.jefferson-center.org (accessed November 2, 2007).

112 Ned Crosby, "Using the Citizens Jury Process for Environmental Decision Making," in *Better Environmental Decisions: Strategies for Governments, Businesses, and Communities*, edited by Ken Sexton et al, 401-419, (Washington, D.C.: Island Press, 1999) 410.

depend on the scope of the problem and the level of public participation. The cost will depend on the time as well as how many people will need to be compensated and by how much.

This chapter provided an introduction to the evaluation criteria, the four processes and the strengths and weaknesses of each process in regard to the criteria. The general evaluation of those methods may be useful for many other types of public policy and resource management issues. The evaluation reveals that the larger the project the more resources needed; but sponsors must also consider the non-monetary value of benefits such as public buy-in, including the decreased likelihood that decisions will face legal challenges, and creative decisions that may arise as part of these processes. The next chapter explores how these four methods can borrow from each other to reach a method that is useful and practical for groundwater management and potentially other policy problems.

Chapter 4: Application and Evaluation

This chapter applies the methods, discussed in the previous chapter, specifically to the case of groundwater management in Texas so that conclusions may be drawn within individual GMAs about which process offers the best balance of the criteria and under what circumstances. No one process will stand out across the board because each GMA has its own set of constraints that will factor into which process is the most practical. Similarly, no one process will stand out for other policy issues because each issue will also have its own set of constraints that may be similar to groundwater but that will also vary.

OPEN MEETINGS

When a GCD or GMA board meets to discuss groundwater management, it is required by statute do so in an open meeting. The qualitative advantage of open meetings is the promotion of transparency, an important first step. However, because the board is not required to address the public or seek public comments, traditional open meetings are not a public involvement method conducive to dialogue. The greatest quantitative advantage of open meetings is that they have no additional costs. A not so obvious advantage is that they are actually quite a flexible process. As long as the open meeting statute requirements are met, other elements may be added to augment the meeting. Such elements include time segments set aside to address the public and share information. For instance, a GMA or GCD board member could outline what the board does and does not have authority over. Or the GMA or GCD manager could explain what a DFC is and how it will be used by the various water planning authorities.

All GMA respondents to the questionnaire reported holding open meetings. Some sought public comment on DFCs, including through the information sharing methods

noted above, and some did not. The usefulness of comments varied. Some GMAs that reported actively seeking public comment and those that made an effort to share information among stakeholders and managers at their meetings also reported that the feedback they received from citizens was very useful in crafting a DFC.[113] Useful comments ranged from information about water demands, ideas for water conservation awareness programs, as well as feedback about helpful tools for the DFC and management process such as a website.[114] Thus, GMAs who took advantage of flexibility and made an effort to expand the purpose of their open meetings were able to obtain more useful information – informed input – in return.

PUBLIC HEARINGS

As previously noted, all GMAs must hold at least one public hearing before a DFC is submitted to the TWDB. The advantages, like those of open meetings, are transparency, relative low cost and quick turnover. While public input is actively sought, neutrality and representation are not as satisfactory as they could be. Again, the advantage of flexibility could correct for this shortfall. In terms of groundwater planning, public hearings could be held more frequently by GMAs, and GCDs for that matter, than the one per year required by HB 1763. An Area or District could step away from the formal term "public hearing" toward a more welcoming "public dialogue" where information is shared in all directions between board members, hydro geologists and representatives of the public and moderated by a neutral facilitator. This concept is similar to that employed by GMA 9 with assistance from the University of Texas. The expansion of public hearings in this way is similar to expanding open meetings as discussed above. Yet, bringing in a neutral facilitator, as GMA 9 did, can help eliminate

[113] Responses to research questionnaires by GMAs 1, 2, 8, 9, 12, 14, 15.
[114] Ibid.

the appearance of bias and foster feelings of trust. Furthermore, expanding open meetings or public hearings to be more of a dialogue facilitated by a third party helps overcome some of the DFC specific problems discussed in Chapter 2, namely addressing:

- vagueness and ambiguity by helping others understand what a DFC is,
- fostering trust among multiple and competing stakeholders,
- spreading public information about groundwater management and conservation.

An expanded hybrid version of open meetings and public hearings, a "public dialogue," is potentially the best method for augmenting public involvement in the DFC process without accumulating disproportionate cost and time factors. The entire length of the process may take a year or less. Meetings would be longer and held more often, an impartial facilitator or record keeper may cost a few hundred dollars, but the process would not be as involved as the remaining two methods discussed in this report.

CONSENSUS BUILDING

None of the GMAs responding to the questionnaire reported using a consensus building process, although some commented that they might try it in the future. The general steps to convening consensus building in the DFC context may be as follows:[115]

1. A GMA board agrees to sponsor a consensus building process, the outcome of which is the language for a desired future condition for the GMA. The board contracts with a professional neutral facilitator to provide administrative support and mitigate bias. The board may involve stakeholders in choosing an acceptable neutral facilitator.
2. The neutral facilitator could take time to study the historical context of groundwater planning in the GMA, current problems related to groundwater and scientific data regarding the resource and population demographics. The

[115] These steps follow the guidelines taken from Carlson, "Convening,"169-197.

facilitator does not necessarily need to be a subject matter expert but does need to understand the scope of the policy issue. This could take a few weeks.

3. The neutral facilitator and GMA board work together to identify stakeholders or interests groups to participate in the consensus building process. Those stakeholders in turn make recommendations about who else should be included and so forth until all parties are identified. The time consumed will depend on how many people the facilitators need to interview. Each interest group chooses a representative and that representative is invited by the facilitator to participate in the consensus process.
4. The neutral facilitator organizes an information session for participants explaining consensus building and negotiation concepts as well as providing a common body of information on the DFC process and the historical and current groundwater situation in the Area. The impartial facilitator works with the stakeholder representatives and the board to determine rules for the process and create a timeline.
5. The participants share the interests of the group they represent. They begin to identify common values, prioritize those values and identify potential components of a desired future condition. The neutral facilitator moderates negotiations while the participants try to reach consensus. The time needed for this step will depend on the number of representatives, the variations in interests, and the availability and complexity of groundwater and demographic data. This step is likely to take several meetings over the course of weeks or months.
6. Once consensus is reached, the group's outcome is reported to the GMA board which then finalizes language for the desired future condition and seeks the

group's final approval before holding the statutory public hearing and submitting the DFC to the TWDB.

Regular board meetings will still uphold open meeting regulations, but the consensus meetings could be closed as long as a majority of the governing body is not present. This would not violate HB 1763 rules. Some may worry that, by holding open consensus meetings, attendees could disrupt the negotiation process. Even though consensus meetings could be closed, to maintain transparency, consensus meetings should be open, and facilitators can assist in minimizing disruption. For example, there may be a comment period for observers at the end of the meeting, or observers may submit written comments at the end of a meeting or via a website.

The entire length of this process could range from six months to a year. Though the qualitative advantages of buy-in, mutual trust, neutral facilitation, informed input and flexibility shine in consensus building, the potential cost of such a lengthy process is the main barrier. In previous years, the length of time itself was a barrier as GMAs tried to reach the December 2007 early deadline for inclusion in the next Regional Water Plans. Even though all but one of the GMAs missed the deadline and the next formal deadline is September 2011, length of time could still be a concern depending on whether GMAs have agreements with their regional water planning areas to include a DFC.[116] For example, GMA 8 submitted DFCs for several minor aquifers by the early deadline, but has an agreement with regional water planning areas to include the DFC for the major Trinity aquifer that is planned for submission this spring.[117]

[116] Robert Mace, Texas Water Development Board, phone interview with the author, March 21, 2008.
[117] Ibid.

CITIZENS JURIES

A citizens jury would be the most involved method for a GMA to use. If direct stakeholders are willing to allow such input to be put into the hands of a "microcosm of the public," then this method would satisfy each qualitative criterion and address nearly every problem outlined in the DFC process in Chapter 2. The steps for using a citizens jury process in a GMA may include:[118]

1. The sponsoring agent, the GMA board, contracts with a neutral third party to facilitate the process. The facilitators and board assemble an advisory committee that might consist of some GCD board members, hydro geologists or water policy experts from an outside Area, and local community leaders who, if it is possible, do not have a direct stake in the outcome such as a church pastor or school principal.
2. The advisory committee and facilitators research the historical context of groundwater in the Area, craft a charge for the jury, and begin selecting witnesses. The charge, similar to that typical of the trademarked Citizens Jury process, may be:
    a. What are the values, in order of priority, that should be reflected in this GMA's desired future condition of the aquifer(s)?
    b. Given those prioritized values, what is the preferred management strategy to achieve the desired future condition of the aquifer(s)?
    c. To implement the preferred management strategy, what tools should be used and what actions should be taken by the GMA board or others, taking into account their respective limits of authority?

[118] These steps are modifications by the author that follow the guidelines in Crosby and Nethercut, "Citizens Juries," and Ward, "Open Juries."

The witness list may include TWDB staff, state or private hydro geologists, GCD general managers, and advocates for stakeholder groups including environmentalists and conservationists, business owners, developers, farmers and ranchers, property owners, etc.

3. The impartial facilitators meanwhile could use a mail or telephone survey to select jurors. While email is very prevalent these days, it is still not as pervasive as a regular mailing address and should not be used for juror selections. An email list compiled by a GMA would be too biased. To keep costs low, twelve jurors could be selected instead of twenty-four.
4. The GMA board and facilitators select a location to hold the witness presentations and juror deliberations. Again, to keep costs low, this process could be from three to five days. On the final day, jurors draft their answers to the charge and give the report to the GMA board and then fill out evaluations.
5. In keeping with Ward's theories, and to address transparency and the spread of public information, the citizens jury process could be open to the public, covered by the local media, and daily reports could be uploaded to a GMA website.

Conducting a citizens jury on the GMA level presents the problem of providing accommodations or additional compensation if jurors and witnesses must travel long distances to the central location. Kenyon's theory of a network jury may have interesting implications when applied to the DFC process. Recall that a network jury consists of holding citizen juries in smaller jurisdictions first, such as a GCD, and then representatives from each smaller jury come together on a jury for a larger jurisdiction, such as a GMA. A network jury process is more suitable for long term planning of a resource that affects a large geographical area and population. A network jury process could be held regularly, at least once every five years or the length of the DFC review

cycle. The logistics of the network allow informed input from the local DFC level to the regional GMA level. Unfortunately, conducting a network jury process, where each GCD holds its own local jury and then reports to the GMA, could also exponentially increase costs and time of the process.

Like consensus building, the citizens jury process could be open or closed. A closed jury process does not violate the HB 1763 rules, which only states that official meetings where a majority of a governing body is present must be open to the public. However, much like consensus meetings, to uphold the value of transparency the advisory committee and facilitators should hold an open jury process and allow for public comment at the end of each day or through written submissions via a website.

Again, an inherent difference between the citizens jury process and the consensus building process is that the outcome, whatever it may be, is determined by a group representing the general public, not a group representing the stakeholder interests. The considerable drawbacks to buy-in were explored in Chapter 3. A potential reconciliation is another hybrid process: conducting a citizens jury to get the reasoned and informed opinion of the general public, and then bring that opinion to the table at a consensus building process.

FURTHER ANALYSIS AND CONCLUSIONS

No matter which of the four traditional or hybrid processes is used by a GMA, websites complement all of them and are a low cost means to share information. Several GMAs already have their own website or have designated a particular GCD website to host GMA information.[119] A web presence allows the GMA to post meeting times, locations, agendas and minutes; any documents that are drafted by the board or others; press releases or archives of local media; contact information, email addresses or

[119] Response to research questionnaires for GMAs 2, 8, and 9.

discussion forums; links to the TWDB website, the regional water planning group, or other useful sites. As more households, libraries and schools receive access to the internet, a GMA website can be an invaluable tool for communication and public engagement.

An additional point in favor of expanding open meetings and public hearings, or using a more involved process such as consensus building or a citizens jury, is that the sheer momentum of an organized process can help a GMA reach a deadline. Only GMA 8 submitted some desired future conditions to the Texas Water Development Board by the early deadline December 2007. GMAs 1, 9, and 13 came close.[120] In the questionnaire response, Ron Fieseler of GMA 9 wrote, "[The process] not only provided extensive information and public input, it served as a driving force which kept our GMA process moving forward at a steady rate." Though it is an additional cost, the act of contracting with an impartial facilitator and paying them an hourly rate is an incentive not to let the process wax and wane over a period of time.

Finally, when trying to determine a desired future condition of an aquifer, there is no such thing as too much information. Expanding the involvement process to any one of these methods brings in more people with diversified insight and cultivates a dialogue based on real information rather than hearsay and speculation. If an expanded public input process engages one more well owner, one more retired geologist, one more family that just moved from another state, then the desired future condition is that much closer to reflecting public desires. GMA managers note that no matter what, there will always be someone who is not satisfied, who disagrees for the sake of disagreeing, or who will petition the desired future condition and pursue legal action. This may be true, but alongside Hardin's claim that an unmanaged commons will always fail and a managed

[120] Robert Mace, Texas Water Development Board, phone interview with the author, March 21, 2008.

one at least has a chance of enduring, a DFC process with limited public input will surely fail, while one that has attempted to at least hear if not satisfy all interests has a chance of success.

Chapter 5: Conclusions and Recommendations

Public involvement processes in the United States have evolved over the last hundred years from merely informing the public and seeking acceptance to actually letting the public make decisions with governing bodies. Yet, the standard public hearing remains a popular default process because it meets the minimum requirements for transparency and taking comments without taking an enormous amount of time or money. Participants are left unsatisfied and some go on to legally challenge the decision made in the hearing. Researchers are still evaluating the range of public engagement methods and their usefulness in an array of policy and conflict situations. This report contributes to current research by showing that in some cases the traditional open meetings and public hearings processes may not warrant total abandon. Taking advantage of their flexible nature and augmenting them to satisfy qualitative criteria such as neutrality and informed input can make a process much more meaningful without overwhelming financial or temporal resources and complicating logistics.

CONCLUSIONS ON GROUNDWATER IN TEXAS

Using the economic criteria of famed economist and native Texan Garrett Hardin, groundwater is unmistakably a common pool resource and must be managed as one, less we see it succumb to the individual desires of private landowners and potential drought. Even though the legislature has created a policy response for public management of this quasi-public good, the Rule of Capture remains in place causing an inherent conflict between the right of landowners and the management process. Many wonder how much longer the Rule of Capture can remain a sustainable water policy in Texas. The Rule discourages conservation and complicates water planning methods such as desired future conditions. Property rights and the Rule of Capture are centuries old concepts, entrenched

in Texas politics and culture. To abolish the Rule of Capture will either take a crisis in water supply or a change in leadership in the legislature. Neither one of these scenarios are farfetched due to the increased population growth rates of both native and non-native Texans and the potential of climate change bringing periods of prolonged drought. Booth and Crow suggest that if the Rule is to remain in place, the legislature must at least provide more explicit delegation of authority to GCDs to avoid further legal battles.[121]

In the mean time, Texans must work under the system of regional water planning and groundwater management areas as explained in House Bill 1763. Under the current system, groundwater conservation districts must work together as a GMA to decide on the desired future conditions of the aquifer(s). HB 1763 mandates GMA and GCD boards hold open meetings and at least one public hearing before a DFC is submitted to the Texas Water Development Board, but offers little funding and direction. Such a vague mandate allows for local control and creativity, but so far this system has produced confusion, mistrust, and a few desired future conditions from one GMA. Groundwater managers and boards have several alternatives that will still satisfy the statutory requirements and collect informed input useful in crafting the language and model runs for a DFC.

CONCLUSIONS ON PROCESSES AND EVALUATIONS: YOU GET WHAT YOU PAY FOR

The discussion on public and quasi-public goods and the evaluation of four public input methods may have broader applications for public managers. Whether natural resource management or other policy issues, the barriers to public engagement may be similar – lack of trust among stakeholders, a sense of urgency, and scarce financial resources. The public engagement processes reviewed in this report are not exhaustive of all the options available to governing bodies. However, the qualitative and quantitative

[121] Booth and Crow, "Regulatory Dance," 37.

criteria can be useful to evaluate other methods that are beyond the scope of this report. Before considering any process, governing bodies or other sponsors must identify what they want out of the engagement process. Does the sponsor want the participants to be advocates for a policy, for a management process, or to spread information to their friends, neighbors and coworkers? Does the sponsor want to leave with information or data, suggestions for action, or values and interests? No matter what the policy issue, a public engagement process: 1) is a delivery system for education on a policy issue or problem; 2) has to draw participation from more people than just the "usual suspects;" 3) typically has to get participants to go beyond stating their position and instead elicit their interests so that common interests may be identified and prioritized.

This study finds that traditional open meetings and public hearings satisfy the quantitative criteria of low cost and short turnaround, but do not meet the qualitative criteria of informed input and building trust through neutrality and representation. The key fourth qualitative criterion, flexibility, is a saving grace that allows these processes to be expanded and molded to overcome their qualitative disadvantages while maintaining lower cost and shorter time burdens. Consensus building and citizens juries are much more complex processes and present the reverse situation – more than satisfying the qualitative criteria while also increasing time and cost.

The correlation between satisfying qualitative and quantitative criteria and the increase in time and cost lead to the ultimate cliché conclusion that one gets what one pays for. However, for a management plan to be approved and implemented, the time and the price may be worth it. A high up-front cost of a full public engagement process may be less than future legal costs to uphold a decision that is made with little public input and thus is protested by one or more parties. Increased public involvement should result in fewer protestations or lawsuits because it reaches out to all who have an interest and is

intended to add legitimacy and support for the decision.[122] Finally, implementing hybrid versions of the processes, such as using a neutral facilitator at public meetings is a little step that can go a long way toward building trust and acceptance without prohibitively increasing the cost.

Some limitations to this report include the narrowness of GMA information available and the exclusion of some public processes beyond the scope of this report. Only in depth case information was readily available for GMA 9. Answers to the questionnaire from other GMAs were often brief, and not all GMAs responded. More research is needed on these and other processes such as survey methods. Partnering with research institutions for assistance can further contribute to the body of knowledge on groundwater management and on public involvement processes.

As of the final drafting of this report, GMA 9, who used a quasi-experimental version of the hybrid "public dialogue" process, has submitted several desired future conditions scenarios to the TWDB for use in groundwater models. GMA 9 is reviewing the model results in a series of public meetings and plans to vote on the desired future conditions in summer 2008.

RECOMMENDATIONS

Chapter 4 applied each of the four public involvement methods to the specific case of groundwater management in Texas and formulated what each process might look like. Each process has its own set of strengths and weaknesses. Determining which process is the best will depend on the individual circumstances in each GMA including sense of urgency, number of competing interests, and budget. The analysis leads to the conclusion that three options exist for each GMA going forward in the DFC process.

[122] PCI, *A Practical Guide,* 8.

Option 1: GMAs can seek minimal levels of input at open meetings and public hearings, following the statute to the letter, and not embracing other opportunities for public involvement.

Option 2: GMAs can adapt aspects of other public input processes to open meetings and public hearings to improve upon the information gathered, neutrality and participation. Employing impartial facilitators at meetings and conducting a "public dialogue" where information is *shared* rather than collected are less expensive ways to meet the qualitative criteria. Or GMAs can opt to use consensus building or citizens jury methods. For any of the three methods they choose, if they do not have the funds available in current budgets, GCDs have the authority to levy small taxes and fees within the district to cover costs.[123] GCDs would have to agree as a GMA about how to cover the costs for the public involvement process and consider that taxes must be approved by voters at the GCD level.

Option 3: GMAs can opt to use the hybrid "public dialogue," consensus building or citizens jury methods but minimize the financial cost by seeking other funding sources. These other sources could include asking the legislature for an appropriation of funding to each GMA; asking the legislature for an increase in staff at the TWDB that are trained in neutral facilitation and dispute resolution;[124] seek grant money from public or private policy dispute resolution institutions; and foster partnerships with state universities or

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[123] According to the Texas Water Code Section 36 a GCD may issue bonds subject to the approval of the water commission (36.171a-g). These bonds may be paid through ad valorem taxes or fees (36.172). Bonds secured with taxes must be approved by a majority of registered voters in the GCD (36.180). GCDs have the authority to levy taxes not to exceed 50 cents on each $100 of assessed valuation and approved by a majority of registered voters in the GCD (36.201). GCDs have the authority to collect fees for a variety of services (36.205). Texas Water Code, http://tlo2.tlc.state.tx.us/statutes/wa.toc.htm (accessed March 30, 2008).

[124] In the 80th Legislative Session the legislature approved about $200,000 per year in funding for the TWDB to hire several groundwater modelers, groundwater quality monitors, and one additional staff person for GMA and GCD relations. Robert Mace, Texas Water Development Board, interview with the author, March 21, 2008.

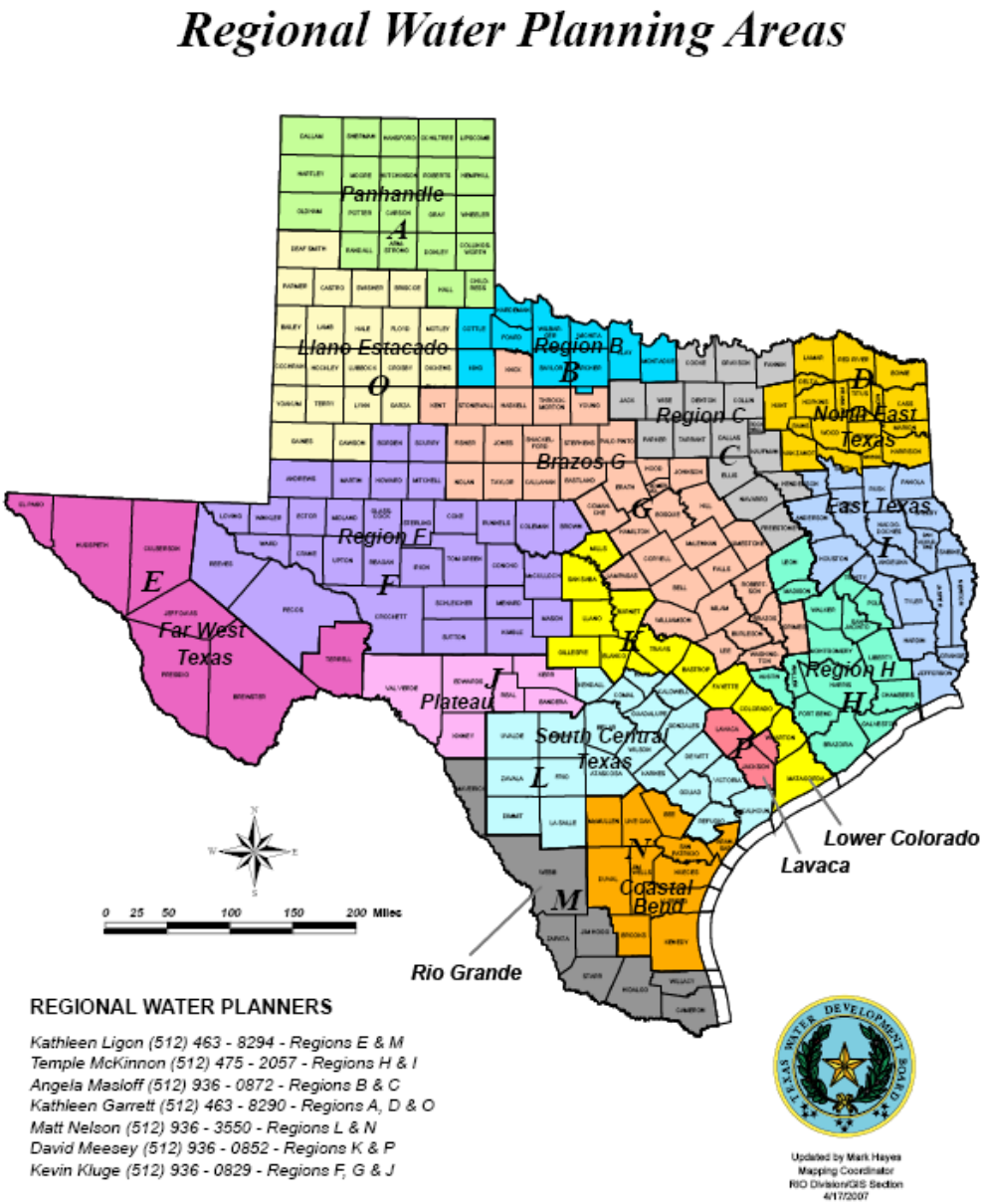
other research institutions.[125] Working with other private or public institutions allows for further research into these methods and their uses for natural resource planning and environmental conflict resolution.

Option 1 is likely to lead to further protest and legal challenges. Options 2 and 3 are recommended as the most practical and the most likely to improve public input processes for the DFC process. As long as open meetings rules are followed and the final procedural public hearing held, these enhanced processes will not violate HB 1763. They will provide District and Area boards with informed public input while balancing cost. The time and cost factors of these expanded processes will add the momentum needed to conclude with a DFC by the state's deadlines. Utilizing websites will complement all of the processes and provide another low-cost means for information sharing and participation. Though it may be unfeasible to satisfy all interests with one or more desired future conditions, an expanded process that truly attempts to engage as much of the public as possible will be more satisfactory and in the end less costly than one that does not.

[125] A list of potential information resources is found in Appendix D.

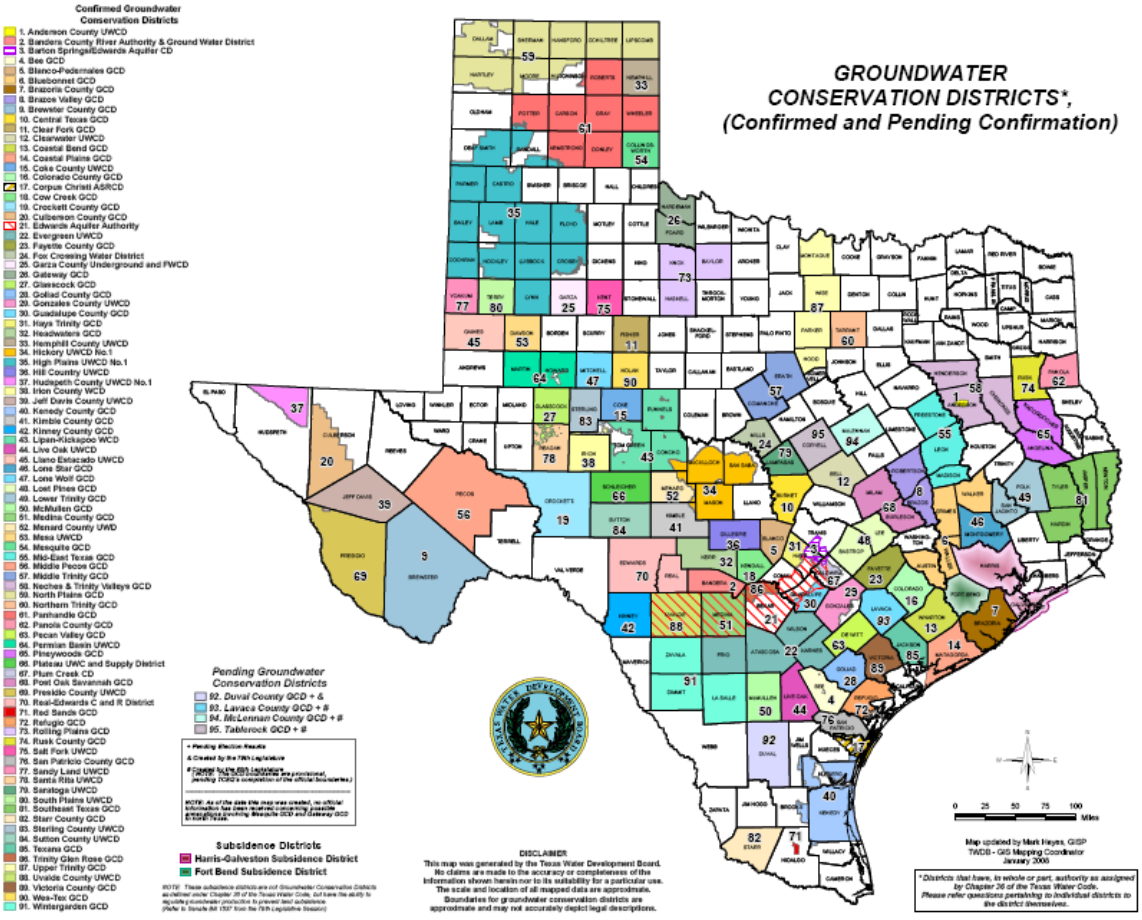
Appendix A: Maps

Map 1: Regional Water Planning Areas A through P.[126]



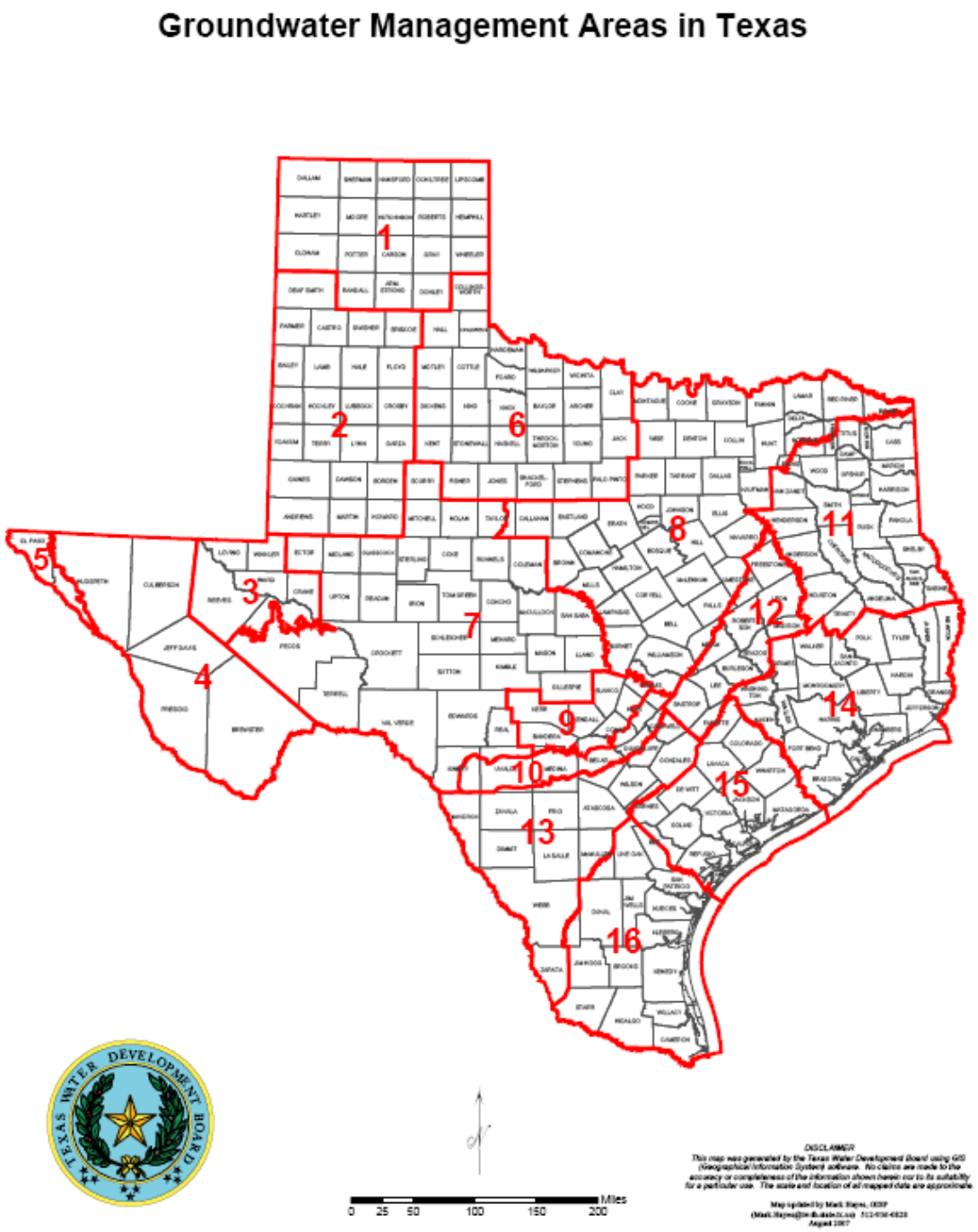
[126] TWDB. http://www.twdb.state.tx.us/mapping/index.asp (accessed February 2, 2008).

Map 2: Groundwater Conservation Districts[127]



[127] TWDB, http://www.twdb.state.tx.us/mapping/index.asp (accessed February 2, 2008).

Map 3: Groundwater Management Areas 1 through 16[128]



[128] TWDB, http://www.twdb.state.tx.us/mapping/index.asp (accessed February 2, 2008).

Appendix B: Desired Future Conditions Questionnaire

A copy of the following questionnaire was emailed to each GMA on the TWDB website, except GMAs 5 and 11 which have no manager or board. The ten GMAs that responded were: 1, 2, 4, 6, 8, 9, 12, 13, 14, and 15. GMAs 4 and 6 reported that their DFC process, including forums for public input, has been minimal because the TWDB has not completed the Groundwater Availability Model needed for their Areas to run different scenarios.

Name:
Title:
Phone:
Email:
Date:
GMA Number / GCD Name:

Privacy Statement

[ ] I hereby authorize the use of my name with any quotes or summaries of the information I have provided in this questionnaire.

[ ] I hereby request that my name not be associated with any quotes or summaries of the information I have provided in this questionnaire.

Please provide detailed answers to the following questions.

1. Did you or someone from your GMA/GCD attend the decision making and cooperative problem solving conference, hosted by the Center to Public Policy Dispute Resolution, in October of 2006?

2. Did your GMA submit a desired future condition to the TWDB by December 2007 early deadline?

3. Is there a sense of urgency regarding groundwater management in your GMA/GCD? Explain why or why not.

4. How has your GMA/GCD involved the public in the desired future condition process? (Examples: Public hearings, open meetings, consensus building, website,

surveys, etc. – see definitions on the following page) Please explain in detail below. (If you have not yet involved the public, please skip to question five)

a. How many times did you involve the public and in what format?

b. Did you incur any costs from your involvement process? (Travel, refreshments, payment for a neutral facilitator, etc.)

c. How were expenses covered? (Cost sharing, donations, individual expense, etc)

d. Did you get the information you wanted from this process?

e. How was the public input used in your decision making process?

f. Are there other processes you would have liked to use but did not? If so, what were they and why weren't they used?

5. Are you planning on including or continuing the involvement of the public in future groundwater management and planning in your GMA/GCD? Please explain in detail below.

a. If yes, what kind of process will you use? (Examples: Public hearings, open meetings, consensus building, website, surveys, etc. – see definitions on the following page)

b. How many times will the public be involved and in what format?

c. How do you plan to use the public input that you receive?

d. Are there other processes you would like to use, and if so, what are they?

e. If you do not plan to involve the public in the GMA planning process, please explain the reasons for not doing so.

6. Further comments:

Standard Definitions

Open meeting: A meeting open to the public because a majority of a governmental body is present where "public business or public policy over which the governmental body has supervision or control is discussed or considered or in which the governmental body takes formal

action."[129] At open meetings, public comment or testimony is not required but may be solicited at the discretion of the governmental body.

Public hearing: An open meeting where the governmental body actively solicits citizen testimony or comment on a matter of public business or public policy; may also be called a "public meeting."

Consensus building: "an effort in which government agencies and other affected parties seek to reach agreement on a course of action to address an issue or set of related issues."[130] A decision is made by agreement of all parties rather than by majority vote and thus no party to the agreement will attempt to obstruct the agreement or its implementation.

[129] State of Texas Government Code, Chapter 551, Open Meetings, http://tlo2.tlc.state.tx.us/statutes/gv.toc.htm (accessed January 12, 2008).
[130] Policy Consensus Initiative, *A Practical Guide to Consensus*, (Santa Fe, New Mexico: Policy Consensus Initiative, 2002), 2, 5, 6.

Appendix C: Summaries of Environmental Citizens Jury Cases in the U.S.

AGRICULTURE AND WATER QUALITY PROJECT – 1984

Eleven total entities sponsored this project including several government agencies such as the Minnesota Department of Agriculture.[131] The policy issue was the impact of agricultural externalities on ground and surface water quality as well as impacts of potential regulation on the industry.[132] The sponsors committed to seriously consider the jury's recommendations, which were that the state should provide $12 million additional funding annually to the issue, require counties to take responsibility, and for farmers to do as much as they can voluntarily.[133] This case was the first time that the Citizens Jury process was conducted statewide with five regional panels of twelve jurors each and then three people from those panels sat on a state panel.[134] The process took about one year.[135]

ENVIRONMENTAL RISK – 1996

The Minnesota Pollution Control Agency, with funding from the U.S. Environmental Protection Agency, sponsored a citizens jury process that took about a year due to the large amount of prep time on the twelve environmental issues discussed. The jury was charged with "[evaluating] the seriousness of the risks associated with the issues and compare those risks to one another."[136] The Agency then considered the jury

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131 Ned Crosby, *Final Report of the Citizens Panel on Agriculture and Water Quality*. (Minneapolis, MN: The Center for New Democratic Processes, January 1985), i.
132 Ibid., 1.
133 Ibid., 2.
134 Ibid., i.
135 Ibid., 1.
136 Ned Crosby, *The Citizens Jury on Comparing Environmental Risk Final Report*, (Minneapolis, MN: The Jefferson Center, 1996), 2-3.

outcome when setting priorities for their future planning. Witnesses included advocacy groups, representatives from industry, and academicians.[137]

LAND USE AND GROWTH – 1997

The Dakota County Board of Commissioners sponsored a Citizens Jury to receive input on the Dakota County Comprehensive Plan on growth and development.[138] The jury developed policy statements and action steps and the Board used them in the plan.[139] The witnesses included advocacy groups, representatives from industry, and county employees.[140] This case illustrates how the Jefferson Center staff and advisory group took steps to ensure that the jury was representative of the county population by assessing census data and asking questions.

The following chart summarizes how the Jefferson Center and advisory committees use census data for the areas they are working in to closely match jury demographics to population demographics. Sometimes staff and advisory committees survey the community and ask specific questions about preconceived attitudes towards the policy issue. This way the jury is balanced between attitudes that the average community member has before receiving extensive and quality information from expert witnesses. For example, in this case the County conducted a survey about citizens thoughts on how the community should grow. One question included whether the current growth rate was too fast, just right or too slow. Prospective jurors were then asked the same question and selected to represent the survey response numbers.[141]

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[137] Crosby, "Environmental Risk," 16.
[138] Ned Crosby, *The Citizens Jury on Dakota County's Comprehensive Plan Final Report*, (Minneapolis, MN: The Jefferson Center, 1997), 1-2.
[139] Ibid., 5.
[140] Ibid., 20.
[141] Crosby, *Dakota County*, 3.

Jury Demographics in Dakota County Land Use and Growth Case - 1997[142]

Characteristics Stratified On	Actual % in County	Target # of Jurors	Actual # of Jurors
Age:			
18-34 years	44%	10	9
35-44 years	24%	6	6
45+ years	32%	8	9
Education:			
High School or less	42%	10	8
Some College	33%	8	12
College or more	25%	6	4
Gender:			
Male	50%	12	12
Female	50%	12	12
Geographic Location:			
Southern/Rural	13%	3	4
North./Established	25%	6	6
Suburban/Develop.	62%	15	14
Race:			
White	94%	22	22
Non-white	6%	2	2
Attitudinal Questions:			
Too Slow/About Right	58%	14	13
Too Fast	42%	10	11

GLOBAL CLIMATE CHANGE – 2002

The Environmental Protection Agency was the sponsoring agent and enthusiastically agreed to consider recommendations by the jury on values and actions related to global climate change.[143] Jurors were sampled only from Baltimore, Maryland, and were charged to identify which global warming impacts were of the most concern and what actions should be taken by the government. Witnesses included scientists,

[142] Crosby, *Dakota County*, 17.
[143] Ned Crosby, *The Citizens Jury on Global Climate Change Final Report*. (Minneapolis, MN: The Jefferson Center, 2002), 1.

advocates and representatives from industry.[144] The jury identified economic, environmental and social concerns including the costs of clean food and water and the negative impacts of poor air and water quality.[145] The jury recommended a multitude of actions of consumers, industry, the U.S. government and the international community.

[144] Crosby, *Global Climate Change*, 31.
[145] Ibid., 6.

Appendix D: Public Policy Dispute Resolution Resources

Center for Public Policy Dispute Resolution
The University of Texas School of Law
727 E. Dean Keaton St.
Austin, TX 78705
Phone: (512) 471-3507
Fax: (512) 232-1191
Website: http://www.utexas.edu/law/cppdr
Jan Summer, Executive Director

Frank Evans Center for Conflict Resolution
South Texas College of Law
1303 San Jacinto St.
Houston, TX 77002
Phone: (713) 646-2998
Website: http://www.stcl.edu/feccr/

George Bush School of Government and Public Service
Texas A&M University
4220 TAMU
College Station, TX 77843
Phone: (979) 862-8842
Website: http://bush.tamu.edu/

Jefferson Center
Website: http://ww.jefferson-center.org/

Lyndon B. Johnson School of Public Affairs
The University of Texas
2315 Red River St.
Sid Richardson Hall, Unit 3
Austin, TX 78712
Phone: (512) 471-3200
Website: http://www.utexas.edu/lbj/
Dr. David J. Eaton, Bess Harris Jones Centennial Professor in Natural Resource Policy Studies

Society for Range Management
10030 W 27th Ave
Wheat Ridge, CO 80215
Phone: 303-986-3309
Fax: 303-986-3892
Website: http://ww.rangelands.org/srm.shtml

Texas Association of Mediators
P.O. Box 191208
Dallas, TX 75219
Website: http://www.txmediator.org/

U.S. Institute for Environmental Conflict Resolution
130 S. Scott Ave.
Tucson, AZ 85701
Phone: (520) 901-8501
Website: http://www.ecr.gov/

Wyoming Department of Agriculture
2219 Carey Avenue
Cheyenne, WY 82002
Phone: (307) 777-7321
Fax: (307) 777-6593
Website: http://agriculture.wy.gov

Glossary

Citizens Jury: a sponsoring governmental body agrees to consider the recommendations of a small sample of the area population regarding a policy issue. An advisory committee convenes the jury, directs the course of action, and selects a range of expert witnesses to provide testimony. A group of neutral facilitators guide the advisory committee through the convening process and coordinate the jury presentation and deliberation processes.[146]

Consensus Building: "an effort in which government agencies and other affected parties seek to reach agreement on a course of action to address an issue or set of related issues."[147] A decision is made by agreement of all parties rather than by majority vote and thus no party to the agreement will attempt to obstruct the agreement or its implementation. The process is often led by neutral facilitators.

Desired Future Condition (DFC): "a management goal that captures the philosophy and policies addressing how an aquifer will be managed."[148]

Groundwater Management Area (GMA): "an area suitable for the management of groundwater resources."[149] The Area boundary generally follows the boundary of major and minor aquifers.

Groundwater Conservation District (GCD): "a district that has the authority to regulate the spacing of water wells, the production from water wells, or both."[150] The District boundary is purely political and does not follow any geological boundary.

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[146] Crosby and Nethercut, "Citizens Juries," 111-119.
[147] Policy Consensus Initiative, *A Practical Guide to Consensus*, (Santa Fe, New Mexico: Policy Consensus Initiative, 2002), 2, 5, 6.
[148] Mace et al, "A Streetcar Named DFC," 3.
[149] Ibid., 1.
[150] Texas Water Development Board. http://www.twdb.state.tx.us/gwrd/gcd/faqgen.htm#g1 (accessed January 27, 2008).

Managed Available Groundwater (MAG): "the amount of groundwater available to be permitted for beneficial use in accordance with the DFCs."[151]

Open Meeting: A meeting open to the public because a majority of a governmental body is present where "public business or public policy over which the governmental body has supervision or control is discussed or considered or in which the governmental body takes formal action."[152] At open meetings, public comment or testimony is not required but may be solicited at the discretion of the governmental body.

Public Hearing: An open meeting where the governmental body actively solicits citizen testimony or comment on a matter of public business or public policy; may also be called a public meeting.

Texas Regional Water Plans: "provides for the orderly development, management, and conservation of water resources and preparation for and response to drought conditions in order that sufficient water will be available at a reasonable cost to ensure public health, safety, and welfare; further economic development; and protect the agricultural and natural resources of that particular region."[153] Regional areas were developed based on ground and surface water resource delineations, political boundaries, utility and economic development, and other factors deemed relevant.[154] Plans must be submitted to the TWDB at a minimum of every five years beginning January 2001.[155]

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[151] Abukhater, et al., "The Future of Groundwater", 1.
[152] State of Texas Government Code, Chapter 551, Open Meetings, http://tlo2.tlc.state.tx.us/statutes/gv.toc.htm (accessed January 12, 2008).
[153] Texas Water Code, Section 16.053a., http://tlo2.tlc.state.tx.us/statutes/gv.toc.htm (accessed January 12, 2008).
[154] Ibid, b.
[155] Texas Administrative Code, Chapter 367.5b., http://info.sos.state.tx.us/pls/pub/readtac$ext.viewtac (accessed February 21, 2008).

Texas Water Development Board (TWDB): Created in 1957, this state agency provides "water planning, data collection and dissemination, financial assistance and technical assistance services to the citizens of Texas."[156]

[156] Texas Water Development Board, http://www.twdb.state.tx.us/about/aboutTWDBmain.asp, accessed January 27, 2008.

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